Bruin
E&P OPERATING, LLC

Environmental Protection Agency
Region 8 Office of Enforcement
Compliance and Environmental Justice
Air Toxics and Technical Enforcement Program
8-ENF-AT
1595 Wynkoop Street
Denver, Colorado 80202-1129

October 30, 2019
Via email
r8airreportenforcement@epa.gov

RE: NSPS OOOOa Annual Report per 40 CFR 60.5420a for
Affected Facilities Owned/Operated by Bruin E&P Operating, LLC
During the Reporting Period 08/03/2018 to 08/02/2019

To Whom It May Concern:

Per the requirements of the referenced regulation, enclosed please find two copies of the completed annual report for Bruin E&P Operating, LLC affected facilities for the reporting period beginning on August 3, 2018 and ending on August 2, 2019.

The report follows the EPA's Compliance and Emissions Data Reporting (CEDRI) format per requirements of 60.5420a(b) (11) as provided by the EPA on the Oil and Gas Reporting page and consists of the following data tables enclosed as Attachment 1.

Table 1 – Site Information - provides general company and affected facility site names. Certifications by a licensed professional engineer of the design of a closed vent system for an applicable facility are enclosed as Attachment 2. Please note that certification for the Missouri well pad is not yet available due to recently completed construction at this well pad.

Table 2 – Well Completions - provides completion information for each well that met the definition of an affected facility per 60.5365a(a).

Table 3 – Centrifugal Compressors - Bruin E&P Operating, LLC did not operate centrifugal compressors meeting the definition of an affected facility per 60.5365a(b) during the reporting period, therefore this table is marked as Not Applicable (N/A).

Table 4 – Reciprocating Compressors - Bruin E&P Operating, LLC did not operate reciprocating compressors meeting the definition of an affected facility per 60.5365a(c) during the reporting period, therefore this table is marked as Not Applicable (N/A).

Table 5 – Controllers - Bruin E&P Operating, LLC did not operate pneumatic controllers meeting the definition of an affected facility per 60.5365a(d) during the reporting period, therefore this table is marked as Not Applicable (N/A).

Table 6 – Storage Vessels - provides information on storage vessels that are an affected facility per 60.5365a(e). Calculations demonstrating potential to emit for each affected tank battery and are enclosed as Attachment 3. Invoices and maintenance logs for control devices/flares are enclosed as Attachment 4. A flare inspection summary log is enclosed as Attachment 5. Steffes flare manuals are enclosed as Attachment 6.

Table 7 – Fugitive Emissions - provides information for each affected well facility subject to the fugitive emissions monitoring and repair program.

Bruin
E&P OPERATING, LLC

October 30, 2019
2018 NSPS OOOOa Annual Report
Bruin E&P Operating, LLC

Table 8 – Pneumatic Pumps - Bruin E&P Operating, LLC did not operate a pneumatic pump meeting the definition of an affected facility per 60.5365a(h) during the reporting period, therefore this table is marked as Not Applicable (N/A).

Certification:
By signing below, I certify that based on information and belief formed after reasonable inquiry, the statements and information in this document and its attachments are true, accurate, and complete.

Should you require any additional information or have questions, please do not hesitate to contact Mr. Dusty Grosulak, HSE Manager at 701-260-1138 or via email at dgrosulak@bruinep.com.

Sincerely,

Kennon Doyal by Julia Foster Rowe

Kennon Doyal
Chief Operations Officer
Bruin E&P Operating, LLC

Enclosures

Copy: Facility Environmental Files

Bruin E&P Operating, LLC 2018-2019: OOOOa Annual Report

Attachment 2: Professional Engineer Certifications

Bruin E&P

Tank Vapor Collection System Design Validation

Pyramid N Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

11/2/2018
Revision 0

Contents

Acronyms

API	American Petroleum Institute
BOPD	Barrels of oil per day
BPD	Barrels per day
BWPD	Barrels of water per day
CSO	Car Sealed Open
DFA	Detonation Flame Arrestor
FGOR	Flash Gas Oil Ratio
FGWR	Flash Gas Water Ratio
GOR	Gas to Oil Ratio
gpm	Gallons per minute
HT	Heater Treater
MAWP	Maximum Allowable Working Pressure
OAL	Over All Length
OD	Outer Diameter
osig	Ounce/ Square Inch (16 osig = 1 psi)
OSI	Ounce/ Square Inch
PCV	Pressure Control Valve
PPIVF	Peak Potential Instantaneous Vapor Flow
PSI	Pounds per Square Inch
SCF	Standard Cubic Foot (defined at standard conditions of 14.7 psia and 60°F)
stb	Stock Tank Barrel (equivalent to 42 U.S. gallons)
VOC	Volatile Organic Compounds
VCS	Vapor Collection System

Certification

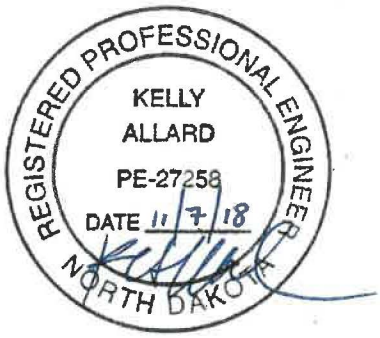
I certify that the closed vent system design and capacity assessment was prepared under my direction or supervision. I further certify that the closed vent system design and capacity assessment was conducted and this report was prepared pursuant to the requirements of subpart OOOOa of 40 CFR part 60 Section 60.5411a(d)(1). Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information.

I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: K Allard Date: 11/7/18

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258



Bruin E&P

Tank Vapor Collection System Design Validation

Pyramid S Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

11/2/2018
Revision 0

Contents

Acronyms

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I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: KCAllard Date: 11/7/18

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258

Bruin E&P

Tank Vapor Collection System Design Validation

Cameron Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

2/25/2019
Revision 0

Contents

Acronyms

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I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: K C Allard Date: 3/5/19

Printed Name: Kelly C Allard

North Dakota Professional Engineer License #: PE-27258

Bruin E&P

Tank Vapor Collection System Design Validation

Little Bear Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

12/7/2018
Revision 0

Contents

Acronyms

API	American Petroleum Institute
BOPD	Barrels of oil per day
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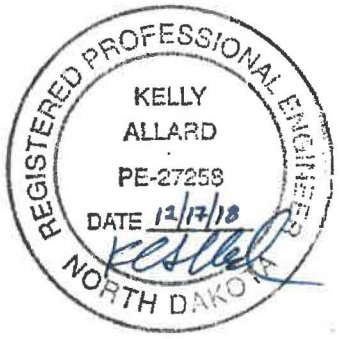
I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: _____ Date: 12/17/18

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258



Bruin E&P

Tank Vapor Collection System Design Validation

Capitol Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®

700 17th St., Suite 2400
Denver, CO 80202

4/29/2019
Revision 0

Contents

Acronyms

API	American Petroleum Institute
BOPD	Barrels of oil per day
BPD	Barrels per day
BWPD	Barrels of water per day
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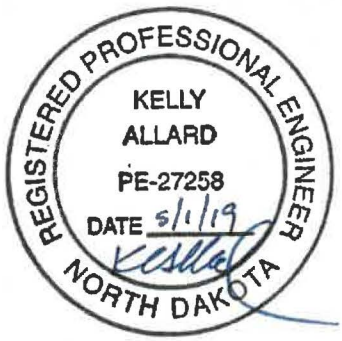
I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: _____ Date: 5/1/19

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258



Bruin E&P

Tank Vapor Collection System Design Validation

Borrud Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®

700 17th St., Suite 2400
Denver, CO 80202

6/12/2019
Revision 0

Contents

Acronyms

API	American Petroleum Institute
BOPD	Barrels of oil per day
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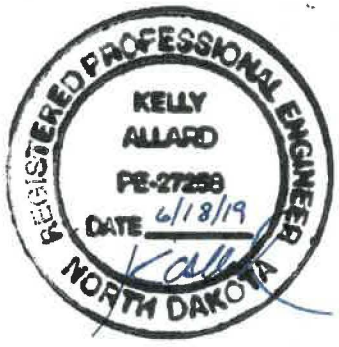
I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: K Allard Date: 6/18/19

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258



Bruin E&P

Tank Vapor Collection System Design Validation

California Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

9/14/2018
Revision 0

Contents

Acronyms

API	American Petroleum Institute
BOPD	Barrels of oil per day
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I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: KAllard Date: 9/18/18

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258

Bruin E&P

Tank Vapor Collection System Design Validation

Lincoln Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

10/15/2018
Revision 0

Contents

Acronyms

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I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: _____ Date: 10/16/18

Printed Name: Kelly C Allard

North Dakota Professional Engineer License #: PE-27258

Bruin E&P

Tank Vapor Collection System Design Validation

Ellingwood Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

9/6/2018
Revision 0

Contents

Acronyms

API	American Petroleum Institute
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Signed: _____ Date: 9/6/18

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258

Bruin E&P

Tank Vapor Collection System Design Validation

Berg Trust Federal Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

2/20/2019
Revision 1

Contents

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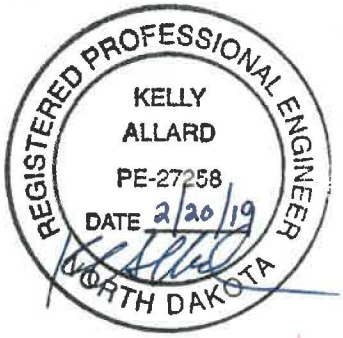
Signed: _____ Date: 2/20/19

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258



Executive Summary

Bruin E&P Operating, LLC (Bruin) contracted ENGlobal in December of 2018 to perform a design review and evaluation of vapor collection systems at specific Bruin oil and natural gas facilities in North Dakota. ENGlobal assessed the capacity of the vapor collection system required to route all vapors from the storage tanks to the control device while maintaining tank pressures within acceptable operating limits.

This report summarizes the evaluation of Bruin's Berg Trust Federal facility in McKenzie County, North Dakota. The Berg Trust Federal facility produces crude oil and natural gas from the Williston Basin in North Dakota. The vapor collection system at the site is designed to ensure preferential flow to the onsite flares, and limits the pressure in any tank head space below 14 osig during normal operations.

ENGlobal concludes that the vapor collection system layout and specifications at the Berg Trust Federal facility site will limit the pressure in the storage tank head space below 14 osig. The vapor collection system has a rating of 939 MSCFD at 14 osig pressure in the storage tank head space. The maximum oil and produced water production rates associated with this rating are 2,250 BOPD for the LL well, 9,000 BOPD for the common wells and 11,250 BWPD. In conclusion, the vapor collection system design has the capacity to maintain the desired storage tank head space pressure. At Bruins' discretion maximum production volumes may be adjusted as long as pressures are verified to stay below 14 osig.

Bruin E&P

Tank Vapor Collection System Design Validation

Windom Facility

Prepared for:

Bruin E&P Operating, LLC

Prepared by:

ENGlobal®
10901 W. 120th Avenue
Suite 400
Broomfield, CO 80021

10/15/2018
Revision 0

Contents

Acronyms

API	American Petroleum Institute
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I am a licensed Professional Engineer in the State of North Dakota and meet the requirements of a Qualified Professional Engineer as defined by subpart OOOOa of 40 CFR part 60 Section 60.5430a.

Signed: KCAllard Date: 10/16/18

Printed Name: KELLY C ALLARD

North Dakota Professional Engineer License #: PE-27258

Executive Summary

Bruin E&P Operating, LLC (Bruin) contracted ENGlobal in May of 2018 to perform a design review and evaluation of vapor collection systems at specific Bruin oil and natural gas facilities in North Dakota. ENGlobal assessed the capacity of the vapor collection system required to route all vapors from the storage tanks to the control device while maintaining tank pressures within acceptable operating limits.

This report summarizes the evaluation of Bruin's Windom facility in Dunn County, North Dakota. The Windom facility produces crude oil and natural gas from the Williston Basin in North Dakota. The vapor collection system at the site is designed to ensure preferential flow to the onsite flares, and limits the pressure in any tank head space below 14 osig during normal operations.

ENGlobal concludes that the vapor collection system layout and specifications at the Windom facility site will limit the pressure in the storage tank head space below 14 osig. The vapor collection system has a rating of 882 MSCFD at 14 osig pressure in the storage tank head space. The maximum oil production rates associated with this rating are 1,271 BOPD for the C Wells and 7,817BOPD for the B Wells. The maximum produced water production rates associated with this rating is 9,018 BWPD. In conclusion, the vapor collection system design has the capacity to maintain the desired storage tank head space pressure. At Bruins' discretion maximum production volumes may be adjusted as long as pressures are verified to stay below 14 osig.

Bruin E&P Operating, LLC 2018-2019: OOOOa Annual Report

Attachment 3: Tank Potential to Emit (PTE) Calculations

Bruin E&P Operating, LLC

Windom Pad

Tanks

Oil Production	3913	BOPD
Flare Gas Volume	39,993	scf/day
Lower Heating Value	2129.34	Btu/scf
Molecular Weight	40.65	lb/lb-mole
VOC wt Fraction	83.97%	
VOC Emission Factor	0.141	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs:		
Benzene wt Fraction	0.0626%	
Toluene wt Fraction	0.1184%	
E-Benzene wt Fraction	0.0047%	
Xylene wt Fraction	0.0247%	
n-Hexane wt Fraction	0.8398%	
2,2,4-Trimethylpentane wt Fraction	0.0000%	
HAP Emission Factor	0.000	tpy/bopd
CO2 wt Fraction	0.29%	
CH4 wt Fraction	2.28%	

CRITERIA POLLUTANT EMISSIONS

VOCs (Allowable):

					DRE		
0.141	TPY VOC/BOPD	x	3913 BOPD	x	99%	=	5.51 TPY

VOCs (Actual):

					DRE		
0.141	TPY VOC/BOPD	x	3913 BOPD	x	99%	=	5.51 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Windom Pad after September 18, 2015.

10/22/2019

Bruin E&P Operating, LLC

Pyramid Pad

Tanks

Oil Production	2412	BOPD
Flare Gas Volume	24,491	scf/day
Lower Heating Value	2122.70	Btu/scf
Molecular Weight	40.53	lb/lb-mole
VOC wt Fraction	71.20%	
VOC Emission Factor	0.139	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0626%
Toluene wt Fraction	0.1184%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8398%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.51%
CH4 wt Fraction	4.96%

CRITERIA POLLUTANT EMISSIONS·

VOCs (Allowable): Using a weighted average from Bakken and Three Forks ProMax Simulations:

									DRE				TPY	
1,020	scf/hr	x	1/379 scf/lb-mole	x	40.53088 lb/lb-mol	x	71.20%	x	99%	=	0.7770 lb/hr	=	3.40	

VOCs (Actual): Using a weighted average from Bakken and Three Forks ProMax Simulations:

									DRE				TPY	
1,020	scf/hr	x	1/379 scf/lb-mole	x	40.53088 lb/lb-mol	x	71.20%	x	99%	=	0.7770 lb/hr	=	3.40	

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Pyramid Pad after September 18, 2015.

10/22/2019

Bruin E&P Operating, LLC

Cameron Pad

Tanks

Oil Production	1961	BOPD
Flare Gas Volume	20,781	scf/day
Lower Heating Value	2142.92	Btu/scf
Molecular Weight	40.95	lb/lb-mole
VOC wt Fraction	72.61%	
VOC Emission Factor	0.149	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs:		
Benzene wt Fraction	0.0728%	
Toluene wt Fraction	0.1028%	
E-Benzene wt Fraction	0.0161%	
Xylene wt Fraction	0.0328%	
n-Hexane wt Fraction	0.8060%	
2,2,4-Trimethylpentane wt Fraction	0.1032%	
HAP Emission Factor	0.000	tpy/bopd
CO2 wt Fraction	0.53%	
CH4 wt Fraction	4.69%	

CRITERIA POLLUTANT EMISSIONS

VOCs (Allowable):

					DRE		
0.149	TPY VOC/BOPD	x	1961 BOPD	x	99%	=	2.93 TPY

VOCs (Actual):

					DRE		
0.149	TPY VOC/BOPD	x	1961 BOPD	x	99%	=	2.93 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Cameron Pad after September 18, 2015.

Bruin E&P Operating, LLC

Missouri Pad

Tanks

Oil Production	2911	BOPD
Flare Gas Volume	31,082	scf/day
Lower Heating Value	2147.61	Btu/scf
Molecular Weight	41.04	lb/lb-mole
VOC wt Fraction	72.96%	
VOC Emission Factor	0.152	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs.		
Benzene wt Fraction	0.0728%	
Toluene wt Fraction	0.1028%	
E-Benzene wt Fraction	0.0161%	
Xylene wt Fraction	0.0328%	
n-Hexane wt Fraction	0.8060%	
2,2,4-Trimethylpentane wt Fraction	0.1032%	
HAP Emission Factor	0.000	tpy/bopd
CO2 wt Fraction	0.52%	
CH4 wt Fraction	4.58%	

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (Allowable):

					DRE		
0.152	TPY VOC/BOPD	x	2911 BOPD	x	99%	=	4.41 TPY

VOCs (Actual):

					DRE		
0.152	TPY VOC/BOPD	x	2911 BOPD	x	99%	=	4.41 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Missouri Pad after September 18, 2015.

Bruin E&P Operating, LLC

Little Bear Pad

Tanks

Oil Production	738	BOPD
Flare Gas Volume	7,414	scf/day
Lower Heating Value	2111.81	Btu/scf
Molecular Weight	40.33	lb/lb-mole
VOC wt Fraction	83.53%	
VOC Emission Factor	0.136	tpy/bopd
CO2 Emission Factor	318469	lb/1,000,000 scf

HAPs:		
Benzene wt Fraction	0.0626%	
Toluene wt Fraction	0.1184%	
E-Benzene wt Fraction	0.0047%	
Xylene wt Fraction	0.0247%	
n-Hexane wt Fraction	0.8398%	
2,2,4-Trimethylpentane wt Fraction	0.0000%	
HAP Emission Factor	0.000	tpy/bopd
CO2 wt Fraction	0.34%	
CH4 wt Fraction	2.41%	

CRITERIA POLLUTANT EMISSIONS

VOCs (PTE):

						DRE			
0.136	TPY VOC/BOPD	x	738 BOPD	x	98%	=	2.00	TPY

VOCs (Allowable):

						DRE			
0.136	TPY VOC/BOPD	x	738 BOPD	x	98%	=	2.00	TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Little Bear Pad after September 18, 2015.

Bruin E and P Operating, LLC

Berg Trust Fed 26A

Tanks

Flare Gas Volume	19,734	scf/day
Lower Heating Value	2118	Btu/scf
Molecular Weight	41.105	lb/lb-mole
VOC wt Fraction	70.15%	
HAP wt Fraction	0.52%	

Controlled emissions are calculated based on a 98% destruction efficiency of the VOC gas.

VOC:	822 scf/hr	x	1/379 scf/lb-mole	x	41.105 lb/lb-mole	x	70.15%	x	98%	=	1.25 lb/hr
	1.25 lb/hr	x	8760 hr/yr	x	1 ton/2000 lb	x	98%	=	5.48 TPY		

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Berg Trust Fed 26A Pad after September 18, 2015.

10/21/2019

Bruin E and P Operating, LLC

Capitol Pad

Tanks

Flare Gas Volume	324,164	scf/day
Lower Heating Value	2000	Btu/scf
Molecular Weight	45.19	lb/lb-mole
VOC wt Fraction	79.80%	
HAP wt Fraction	2.26%	

Controlled emissions are calculated based on a 99% destruction efficiency of the VOC gas.

VOC: 13,507 scf/hr x 1/379 scf/lb-mole x 45.19 lb/lb-mole x 79.80% x 99% = 12.85 lb/hr

12.85 lb/hr x 8760 hr/yr x 1 ton/2000 lb x 99% = 56.29 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Capitol Pad after September 18, 2015.

÷18 tanks present = 3.16 Tpy.
JTR

Bruin E and P operating, LLC

Borrud 1B Pad

Tanks

Flare Gas Volume	40,704 scf/day
Lower Heating Value	2035.133 Btu/scf
Molecular Weight	39.44333 lb/lb-mole
VOC wt Fraction	68.69%
HAP wt Fraction	0.60%

Controlled emissions are calculated based on a 99% destruction efficiency of the VOC gas.

VOC: 1,696 scf/hr x 1/379 scf/lb-mole x 39.4433 lb/lb-mole x 68.69% x 99% = 1.21 lb/hr

1.21 lb/hr x 8760 hr/yr x 1 ton/2000 lb x 99% = 5.31 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Borrud 1B Pad after September 18, 2015.

Bruin E&P Operating, LLC

Wilson Pad

Tanks

Oil Production	535	BOPD
Flare Gas Volume	5,542	scf/day
Lower Heating Value	2141.99	Btu/scf
Molecular Weight	40.88	lb/lb-mole
VOC wt Fraction	84.29%	
VOC Emission Factor	0.145	tpy/bopd
CO2 Emission Factor	323074	lb/1,000,000 scf

HAPs:		
Benzene wt Fraction	0.0626%	
Toluene wt Fraction	0.1184%	
E-Benzene wt Fraction	0.0047%	
Xylene wt Fraction	0.0247%	
n-Hexane wt Fraction	0.8398%	
2,2,4-Trimethylpentane wt Fraction	0.0000%	
HAP Emission Factor	0.000	tpy/bopd
CO2 wt Fraction	0.25%	
CH4 wt Fraction	2.20%	

CRITERIA POLLUTANT EMISSIONS·

VOCs (PTE):

						DRE			
0.145	TPY VOC/BOPD	x	535 BOPD	x	98%	=	1.55	TPY

VOCs (Allowable):

						DRE			
0.145	TPY VOC/BOPD	x	535 BOPD	x	98%	=	1.55	TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Wilson Pad after September 18, 2015.

10/22/2019

Bruin E&P Operating, LLC

California Pad

Tanks

Oil Production	651	BOPD
Flare Gas Volume	6,619	scf/day
Lower Heating Value	2123.32	Btu/scf
Molecular Weight	40.54	lb/lb-mole
VOC wt Fraction	83.82%	
VOC Emission Factor	0.139	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs.	
Benzene wt Fraction	0.0626%
Toluene wt Fraction	0.1184%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8398%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.31%
CH4 wt Fraction	2.33%

CRITERIA POLLUTANT EMISSIONS

VOCs (Allowable):

					DRE		
0.139	TPY VOC/BOPD	x	651 BOPD	x	99%	=	0.91 TPY

VOCs (Actual):

					DRE		
0.139	TPY VOC/BOPD	x	651 BOPD	x	99%	=	0.91 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the California Pad after September 18, 2015.

Bruin E&P Operating, LLC

Lincoln Pad

Tanks

Oil Production	493	BOPD
Flare Gas Volume	5,102	scf/day
Lower Heating Value	2141.99	Btu/scf
Molecular Weight	40.88	lb/lb-mole
VOC wt Fraction	84.29%	
VOC Emission Factor	0.145	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0626%
Toluene wt Fraction	0.1184%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8398%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.25%
CH4 wt Fraction	2.20%

CRITERIA POLLUTANT EMISSIONS

VOCs (Allowable):

						DRE			
0.145	TPY VOC/BOPD	x	493 BOPD	x	99%	=	0.71	TPY

VOCs (Actual):

						DRE			
0.145	TPY VOC/BOPD	x	493 BOPD	x	99%	=	0.71	TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Lincoln Pad after September 18, 2015.

Bruin E&P Operating, LLC

Ellingwood Pad

Tanks

Oil Production	510	BOPD
Flare Gas Volume	5,525	scf/day
Lower Heating Value	2156.51	Btu/scf
Molecular Weight	41.21	lb/lb-mole
VOC wt Fraction	73.62%	
VOC Emission Factor	0.156	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0728%
Toluene wt Fraction	0.1028%
E-Benzene wt Fraction	0.0161%
Xylene wt Fraction	0.0328%
n-Hexane wt Fraction	0.8060%
2,2,4-Trimethylpentane wt Fraction	0.1032%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.50%
CH4 wt Fraction	4.38%

CRITERIA POLLUTANT EMISSIONS

VOCs (Allowable): Using a weighted average from Bakken and Three Forks ProMax Simulations:

								DRE				TPY
230 scf/hr	x	1/379 scf/lb-mole	x	41.20521 lb/lb-mol	x	73.62%	x	99%	=	0.1843 lb/hr	=	0.81

VOCs (Actual): Using a weighted average from Bakken and Three Forks ProMax Simulations:

								DRE				TPY
230 scf/hr	x	1/379 scf/lb-mole	x	41.20521 lb/lb-mol	x	73.62%	x	99%	=	0.1843 lb/hr	=	0.81

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Ellingwood Pad after September 18, 2015.

Bruin E&P Operating, LLC

Anderson Pad

Tanks

Oil Production	5060	BOPD
Flare Gas Volume	54,570	scf/day
Lower Heating Value	2153.53	Btu/scf
Molecular Weight	41.15	lb/lb-mole
VOC wt Fraction	73.40%	
VOC Emission Factor	0.154	tpy/bopd
CO2 Emission Factor	322157	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0728%
Toluene wt Fraction	0.1028%
E-Benzene wt Fraction	0.0161%
Xylene wt Fraction	0.0328%
n-Hexane wt Fraction	0.8060%
2,2,4-Trimethylpentane wt Fraction	0.1032%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.50%
CH4 wt Fraction	4.44%

CRITERIA POLLUTANT EMISSIONS

VOCs (PTE for all tanks):

0.154	TPY VOC/BOPD	x	5060 BOPD	x	DRE 98%	=	15.62	TPY

VOCs (PTE per tank):

15.621	TPY for 8 Tanks	/	8 Tanks	=	1.95	TPY per Tank

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Anderson Pad after September 18, 2015.

Bruin E&P Operating, LLC

Bierstadt Pad

Tanks

Oil Production	1932	BOPD
Flare Gas Volume	197,540	scf/day
Lower Heating Value	2730.14	Btu/scf
Molecular Weight	48.33	lb/lb-mole
VOC wt Fraction	83.60%	
VOC Emission Factor	1.987	tpy/bopd
CO2 wt Fraction	0.34%	
CO2 Emission Factor	381938	lb/1,000,000 scf

HAPs:		
Benzene wt Fraction	0.0728%	
Toluene wt Fraction	0.1028%	
E-Benzene wt Fraction	0.0161%	
Xylene wt Fraction	0.0328%	
n-Hexane wt Fraction	0.8060%	
2,2,4-Trimethylpentane wt Fraction	0.1032%	
HAP Emission Factor	0.002	tpy/bopd
CH4 wt Fraction	2.43%	

CRITERIA POLLUTANT EMISSIONS

VOCs (PTE for all tanks):

						DRE			
1.987	TPY VOC/BOPD	x	1932 BOPD	x	96%	=	76.78	TPY

VOCs (PTE per tank):

76.779	TPY for 8 Tanks	/	8 Tanks	=	9.60 TPY per Tank

VOC PTE per tank is more than 6 tpy; therefore the tanks are affected sources under NSPS OOOOa due to the the tanks emitting more than 6 tpy and construction/modification of the Bierstadt Pad after September 18, 2015.

10/12/2018

Bruin E&P Operating, LLC

Bross Pad

Tanks

Oil Production	3898 BOPD	Adjusted Oil Production	3898 BOPD
Flare Gas Volume	392,223 scf/day	Adjusted Flare Gas Volume	392,223 scf/day
Lower Heating Value	2701.58903 Btu/scf	CO2 Emission Factor	377375 lb/1,000,000 scf
Molecular Weight	47.77192677 lb/lb-mole		
VOC wt Fraction	82.87%		
VOC Emission Factor	1.917 tpy/bopd		
HAPs:			
Benzene wt Fraction	0.0526%		
Toluene wt Fraction	0.1184%		
E-Benzene wt Fraction	0.0047%		
Xylene wt Fraction	0.0247%		
n-Hexane wt Fraction	0.8996%		
2,2,4-Trimethylpentane wt Fraction	0.0000%		
HAP Emission Factor	0.002 tpy/bopd		
CO2 wt Fraction	0.29%		
CH4 wt Fraction	2.30%		

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE):

1.917	TPY VOC/BOPD	x	3898.19 BOPD	x	DRE 98%	=	149.42	TPY

VOCs (Allowable):

1.917	TPY VOC/BOPD	x	3898.19 BOPD	x	DRE 98%	=	149.42	TPY

HAPs (PTE):

Using E&P Tanks Run:

																		TPY
Benzene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	wt% 0.06%	x	DRE 98%	=	0.0258 lb/hr	=	0.1130
E-Benzene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.00%	x	98%	=	0.0019 lb/hr	=	0.0085
Toluene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.12%	x	98%	=	0.0488 lb/hr	=	0.2137
n-Hexane	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.84%	x	98%	=	0.3460 lb/hr	=	1.5154
Xylene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.02%	x	98%	=	0.0102 lb/hr	=	0.0445
2,2,4-Trimethylpentane	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.00%	x	98%	=	0.0000 lb/hr	=	0.0000
												Uncontrolled TOTAL HAPS (TPY)	=	1.8950

HAPs (Allowable):

Benzene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.06%	x	98%	=	0.0258 lb/hr	=	0.1130
E-Benzene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.00%	x	98%	=	0.0019 lb/hr	=	0.0085
Toluene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.12%	x	98%	=	0.0488 lb/hr	=	0.2137
n-Hexane	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.84%	x	98%	=	0.3460 lb/hr	=	1.5154
Xylene	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.02%	x	98%	=	0.0102 lb/hr	=	0.0445
2,2,4-Trimethylpentane	16,343	scf/hr	x	1/379 scf/lb-mole	x	47.77193 lb/lb-mol	x	0.00%	x	98%	=	0.0000 lb/hr	=	0.0000
												Controlled TOTAL HAPS (TPY)	=	1.8950

VOC PTE per tank is 149.42/12 tanks= 12.45 TPY per tank. The tanks are an affected source under NSPS OOOOa due to contruction/modification of the Bross pad after September 18, 2015.

Bruin E&P Operating, LLC

Handies Pad

Tanks

Oil Production	874	BOPD	Adjusted Oil Production	874	BOPD
Flare Gas Volume	89,113	scf/day	Adjusted Flare Gas Volume	89,113	scf/day
Lower Heating Value	2707.700252	Btu/scf	CO2 Emission Factor	378274	lb/1,000,000 scf
Molecular Weight	47.8721739	lb/lb-mole			
VOC wt Fraction	83.12%				
VOC Emission Factor	1.953	tpy/bopd			
HAPs:					
Benzene wt Fraction	0.0626%				
Toluene wt Fraction	0.1184%				
E-Benzene wt Fraction	0.0047%				
Xylene wt Fraction	0.0247%				
n-Hexane wt Fraction	0.8398%				
2,2,4-Trimethylpentane wt Fraction	0.0000%				
HAP Emission Factor	0.002	tpy/bopd			
CO2 wt Fraction	0.27%				
CH4 wt Fraction	2.23%				

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE):

					DRE		
1.953	TPY VOC/BOPD	x	873.703 BOPD	x	98%	=	34.12 TPY

VOCs (PTE per tank):

34.122	TPY for 8 Tanks	/	8 Tanks	=	4.27 TPY per Tank

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction/modification of the Handies Pad after September 18, 2015.

Bruin E&P Operating, LLC

La Plata Pad

Tanks

Oil Production	1308	BOPD	Adjusted Oil Production	1308	BOPD
Flare Gas Volume	133,472	scf/day	Adjusted Flare Gas Volume	133,472	scf/day
Lower Heating Value	2727.41	Btu/scf	CO2 Emission Factor	381512	lb/1,000,000 scf
Molecular Weight	48.28	lb/lb-mole			
VOC wt Fraction	83.50%				
VOC Emission Factor	1.978	tpy/bopd			
HAPs:					
Benzene wt Fraction	0.0728%				
Toluene wt Fraction	0.1028%				
E-Benzene wt Fraction	0.0161%				
Xylene wt Fraction	0.0328%				
n-Hexane wt Fraction	0.8060%				
2,2,4-Trimethylpentane wt Fraction	0.1032%				
HAP Emission Factor	0.002	tpy/bopd			
CO2 wt Fraction	0.34%				
CH4 wt Fraction	2.43%				

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE):

					DRE			
1.978	TPY VOC/BOPD	x	1308.1 BOPD	x	98%	=	51.76	TPY

VOCs (Allowable):

					DRE			
1.978	TPY VOC/BOPD	x	1308.10 BOPD	x	98%	=	51.76	TPY

HAPs (PTE):

Using E&P Tanks Run:

																	TPY
									wt%		DRE						
Benzene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.07%	x	98%	=	0.0103 lb/hr	=	0.0452
E-Benzene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.02%	x	98%	=	0.0023 lb/hr	=	0.0100
Toluene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.10%	x	98%	=	0.0146 lb/hr	=	0.0638
n-Hexane	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.81%	x	98%	=	0.1142 lb/hr	=	0.5002
Xylene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.03%	x	98%	=	0.0046 lb/hr	=	0.0203
2,2,4-Trimethylpentane	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.10%	x	98%	=	0.0146 lb/hr	=	0.0641
												Uncontrolled TOTAL HAPS (TPY)	=	0.7036

HAPs (Allowable):

Benzene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.07%	x	98%	=	0.0103 lb/hr	=	0.0452
E-Benzene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.02%	x	98%	=	0.0023 lb/hr	=	0.0100
Toluene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.10%	x	98%	=	0.0146 lb/hr	=	0.0638
n-Hexane	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.81%	x	98%	=	0.1142 lb/hr	=	0.5002
Xylene	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.03%	x	98%	=	0.0046 lb/hr	=	0.0203
2,2,4-Trimethylpentane	5,561	scf/hr	x	1/379 scf/lb-mole	x	48.28045 lb/lb-mol	x	0.10%	x	98%	=	0.0146 lb/hr	=	0.0641
												Controlled TOTAL HAPS (TPY)	=	0.7036

VOC PTE per tank is 51.76/10 tanks=5.18 TPY per tank. The tanks are an affected source under NSPS OOOOa due to construction/modification of the LaPlata pad after September 18, 2015

Bruin E&P Operating, LLC

Longs Pad

Tanks

Oil Production	2829	BOPD
Flare Gas Volume	30,706	scf/day
Lower Heating Value	2157.42	Btu/scf
Molecular Weight	41.22	lb/lb-mole
VOC wt Fraction	73.69%	
VOC Emission Factor	0.156	tpy/bopd
CO2 Emission Factor	322788	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0728%
Toluene wt Fraction	0.1028%
E-Benzene wt Fraction	0.0161%
Xylene wt Fraction	0.0328%
n-Hexane wt Fraction	0.8060%
2,2,4-Trimethylpentane wt Fraction	0.1032%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.49%
CH4 wt Fraction	4.36%

CRITERIA POLLUTANT EMISSIONS

VOCs (PTE for all tanks):

0.156	TPY VOC/BOPD	x	2829 BOPD	x	DRE 98%	=	8.84	TPY

VOCs (PTE per tank):

8.839	TPY for 8 Tanks	/	6 Tanks	=	1.47	TPY per Tank

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Longs Pad after September 18, 2015.

Bruin E&P Operating, LLC

Oklahoma Pad

Tanks

Oil Production	1569	BOPD	Adjusted Oil Production	1569	BOPD
Flare Gas Volume	159,646	scf/day	Adjusted Flare Gas Volume	159,646	scf/day
Lower Heating Value	2706.71	Btu/scf	CO2 Emission Factor	378128	lb/1,000,000 scf
Molecular Weight	47.86	lb/lb-mole			
VOC wt Fraction	83.06%				
VOC Emission Factor	1.947	tpy/bopd			

HAPs:	
Benzene wt Fraction	0.0626%
Toluene wt Fraction	0.1184%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8398%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.002 tpy/bopd
CO2 wt Fraction	0.27%
CH4 wt Fraction	2.24%

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE for all tanks):

					DRE		
1.947 TPY VOC/BOPD	x	1568.67 BOPD	x	98%	=	61.08 TPY

VOCs (PTE per tank):

61.080 TPY for 12 Tanks	/	12 Tanks	=	5.09 TPY per Tank

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction/modification of the Oklahoma Pad after September 18, 2015.

Bruin E&P Operating, LLC

Phoenix Pad

Tanks

Oil Production	2714	BOPD
Flare Gas Volume	27,927	scf/day
Lower Heating Value	2136.96	Btu/scf
Molecular Weight	40.77	lb/lb-mole
VOC wt Fraction	84.14%	
VOC Emission Factor	0.143	tpy/bopd
CO2 wt Fraction	0.27%	
CO2 Emission Factor	322164	lb/1,000,000 scf

HAPs:

Benzene wt Fraction	0.0626%	
Toluene wt Fraction	0.1184%	
E-Benzene wt Fraction	0.0047%	
Xylene wt Fraction	0.0247%	
n-Hexane wt Fraction	0.8398%	
2,2,4-Trimethylpentane wt Fraction	0.0000%	
HAP Emission Factor	0.002	tpy/bopd
CH4 wt Fraction	2.24%	

CRITERIA POLLUTANT EMISSIONS

VOCs (PTE for all tanks):

0.143	TPY VOC/BOPD	x	2714 BOPD	x	DRE 98%	=	7.76 TPY for all Tanks

VOCs (PTE per tank):

7.764	TPY for 8 Tanks	/	8 Tanks	=	0.97 TPY per Tank

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Phoenix Pad after September 18, 2015.

Bruin E&P Operating, LLC

Pikes-Ouray Pad

Tanks

Oil Production	4634	BOPD	Adjusted Oil Production	4634	BOPD
Flare Gas Volume	473,807	scf/day	Adjusted Flare Gas Volume	473,807	scf/day
Lower Heating Value	2730.514455	Btu/scf	CO2 Emission Factor	361997	lb/1,000,000 scf
Molecular Weight	48.33775343	lb/lb-mole			
VOC wt Fraction	83.61%				
VOC Emission Factor	1.988	tpy/bopd			
HAPs:					
Benzene wt Fraction	0.0726%				
Toluene wt Fraction	0.1026%				
E-Benzene wt Fraction	0.0161%				
Xylene wt Fraction	0.0326%				
n-Hexane wt Fraction	0.8060%				
2,2,4-Trimethylpentane wt Fraction	0.1032%				
HAP Emission Factor	0.002	tpy/bopd			
CO2 wt Fraction	0.34%				
CH4 wt Fraction	2.43%				

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE):

					DRE		
1.988	TPY VOC/BOPD	x	4633.94 BOPD	x	98%	=	184.21 TPY

VOCs (Allowable):

					DRE		
1.988	TPY VOC/BOPD	x	4633.94 BOPD	x	98%	=	184.21 TPY

HAPs (PTE):

Using E&P Tanks Run:

																		TPY
									wt%		DRE							
Benzene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.07%	x	98%	=	0.0367 lb/hr	=	0.1605
E-Benzene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.02%	x	98%	=	0.0081 lb/hr	=	0.0356
Toluene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.10%	x	98%	=	0.0518 lb/hr	=	0.2268
n-Hexane	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.81%	x	98%	=	0.4059 lb/hr	=	1.7777
Xylene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.03%	x	98%	=	0.0165 lb/hr	=	0.0723
2,2,4-Trimethylpentane	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.10%	x	98%	=	0.0520 lb/hr	=	0.2277
												Uncontrolled TOTAL HAPS (TPY)	=	2.5005

HAPs (Allowable):

Benzene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.07%	x	98%	=	0.0367 lb/hr	=	0.1605
E-Benzene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.02%	x	98%	=	0.0081 lb/hr	=	0.0356
Toluene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.10%	x	98%	=	0.0518 lb/hr	=	0.2268
n-Hexane	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.81%	x	98%	=	0.4059 lb/hr	=	1.7777
Xylene	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.03%	x	98%	=	0.0165 lb/hr	=	0.0723
2,2,4-Trimethylpentane	19,742	scf/hr	x	1/379 scf/lb-mole	x	48.33775 lb/lb-mol	x	0.10%	x	98%	=	0.0520 lb/hr	=	0.2277
												Controlled TOTAL HAPS (TPY)	=	2.5005

VOC PTE per tank is 184.21/12 tanks= 15.35 TPY per tank. The tanks are an affected source under NSPS OOOOa due to construction/modification of the Pikes/ Ouray pad after September 18, 2015.

Bruin E&P Operating, LLC

San Luis-Alamosito Pad

Tanks

Oil Production	4819	BOPD	Adjusted Oil Production	4819	BOPD
Flare Gas Volume	488,840	scf/day	Adjusted Flare Gas Volume	488,840	scf/day
Lower Heating Value	2706.154478	Btu/scf	CO2 Emission Factor	378047	lb/1,000,000 scf
Molecular Weight	47.84681735	lb/lb-mole			
VOC wt Fraction	83.06%				
VOC Emission Factor	1.944	tpy/bopd			

HAPs:

Benzene wt Fraction	0.0629%
Toluene wt Fraction	0.1164%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8395%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.002 tpy/bopd
CO2 wt Fraction	0.27%
CH4 wt Fraction	2.25%

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE):

1.944	TPY VOC/BOPD	x	4819.07 BOPD	x	DRE 96%	=	187.32	TPY		

VOCs (Allowable):

1.944	TPY VOC/BOPD	x	4819.07 BOPD	x	DRE 96%	=	187.32	TPY		

HAPs (PTE):

Using E&P Tanks Run:

																		TPY
Benzene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	wt% 0.06%	x	DRE 96%	=	0.0323 lb/hr	=	0.1413
E-Benzene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.00%	x	96%	=	0.0024 lb/hr	=	0.0106
Toluene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.12%	x	96%	=	0.0610 lb/hr	=	0.2672
n-Hexane	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.84%	x	96%	=	0.4328 lb/hr	=	1.8956
Xylene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.02%	x	96%	=	0.0127 lb/hr	=	0.0556
2,2,4-Trimethylpentane	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.00%	x	96%	=	0.0000 lb/hr	=	0.0000
										Uncontrolled TOTAL HAPS (TPY)	=			2.3703

HAPs (Allowable):

Benzene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.06%	x	96%	=	0.0323 lb/hr	=	0.1413
E-Benzene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.00%	x	96%	=	0.0024 lb/hr	=	0.0106
Toluene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.12%	x	96%	=	0.0610 lb/hr	=	0.2672
n-Hexane	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.84%	x	96%	=	0.4328 lb/hr	=	1.8956
Xylene	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.02%	x	96%	=	0.0127 lb/hr	=	0.0556
2,2,4-Trimethylpentane	20,410	scf/hr	x	1/379 scf/lb-mole	x	47.84682 lb/lb-mol	x	0.00%	x	96%	=	0.0000 lb/hr	=	0.0000
										Controlled TOTAL HAPS (TPY)	=			2.3703

VOC PTE per tank is 187.32/14 tanks = 13.38 TPY per tank. The tanks are an affected source under NSPS OOOOa due to construction/modification of the SanLuis/Alamosito pad after September 18, 2015.

Bruin E&P Operating, LLC

Sneffels Pad

Tanks

Oil Production	2749	BOPD
Flare Gas Volume	28,019	scf/day
Lower Heating Value	2126.37	Btu/scf
Molecular Weight	40.60	lb/lb-mole
VOC wt Fraction	83.90%	
VOC Emission Factor	0.140	tpy/bopd
CO2 Emission Factor	120000	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0626%
Toluene wt Fraction	0.1184%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8398%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.000 tpy/bopd
CO2 wt Fraction	0.30%
CH4 wt Fraction	2.31%

CRITERIA POLLUTANT EMISSIONS

VOCs (Allowable):

					DRE		
0.140	TPY VOC/BOPD	x	2749 BOPD	x	98%	=	7.70 TPY

VOCs (Actual):

					DRE		
0.140	TPY VOC/BOPD	x	2749 BOPD	x	98%	=	7.70 TPY

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to the construction of the Sneffels Pad after September 18, 2015.

10/21/19

Bruin E&P Operating, LLC

Stewart-Vermejo Pad

Tanks

Oil Production	5086 BOPD	Adjusted Oil Production	5086 BOPD
Flare Gas Volume	350,614 scf/day	Adjusted Flare Gas Volume	350,614 scf/day
Lower Heating Value	2466.3939 Btu/scf	CO2 Emission Factor	351416 lb/1,000,000 scf
Molecular Weight	47.46854242 lb/lb-mole		
VOC wt Fraction	83.84%		
VOC Emission Factor	1.320 tpy/bopd		
HAPs:			
Benzene wt Fraction	0.0728%		
Toluene wt Fraction	0.1028%		
E-Benzene wt Fraction	0.0161%		
Xylene wt Fraction	0.0328%		
n-Hexane wt Fraction	0.5060%		
2,2,4-Trimethylpentane wt Fraction	0.1032%		
HAP Emission Factor	0.002 tpy/bopd		
CO2 wt Fraction	0.01%		
CH4 wt Fraction	2.56%		

CRITERIA POLLUTANT EMISSIONS[a]

VOCs (PTE):

				DRE		
1.320 TPY VOC/BOPD	x	5086.07 BOPD	x	98%	=	134.27 TPY

VOCs (Allowable):

				DRE		
1.320 TPY VOC/BOPD	x	5086.07 BOPD	x	98%	=	134.27 TPY

HAPs (PTE):

Using E&P Tanks Run:

								wt%		DRE				TPY
Benzene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.07%	x	98%	=	0.0266 lb/hr	=	0.1167
E-Benzene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.02%	x	98%	=	0.0059 lb/hr	=	0.0258
Toluene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.10%	x	98%	=	0.0376 lb/hr	=	0.1648
n-Hexane	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.81%	x	98%	=	0.2949 lb/hr	=	1.2916
Xylene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.03%	x	98%	=	0.0120 lb/hr	=	0.0525
2,2,4-Trimethylpentane	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.10%	x	98%	=	0.0378 lb/hr	=	0.1654
											Uncontrolled TOTAL HAPS (TPY)	=	1.8171

HAPs (Allowable):

Benzene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.07%	x	98%	=	0.0266 lb/hr	=	0.1167
E-Benzene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.02%	x	98%	=	0.0059 lb/hr	=	0.0258
Toluene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.10%	x	98%	=	0.0376 lb/hr	=	0.1648
n-Hexane	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.81%	x	98%	=	0.2949 lb/hr	=	1.2916
Xylene	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.03%	x	98%	=	0.0120 lb/hr	=	0.0525
2,2,4-Trimethylpentane	14,609 scf/hr	x	1/379 scf/lb-mole	x	47.46854 lb/lb-mol	x	0.10%	x	98%	=	0.0378 lb/hr	=	0.1654
											Controlled TOTAL HAPS (TPY)	=	1.8171

VOC PTE per tank is 134.27/27 tanks = 4.973 TPY per tank. The tanks are an affected source under NSPS OOOOa due to construction/modification of the Stewart and Vermejo pads after September 15, 2015.

Bruin E&P Operating, LLC

Wetterhorn Pad

Tanks

Oil Production	1414	BOPD
Flare Gas Volume	14,360	scf/day
Lower Heating Value	2123.05	Btu/scf
Molecular Weight	40.54	lb/lb-mole
VOC wt Fraction	83.81%	
VOC Emission Factor	0.139	tpy/bopd
CO2 wt Fraction	0.31%	
CO2 Emission Factor	320183	lb/1,000,000 scf

HAPs:	
Benzene wt Fraction	0.0626%
Toluene wt Fraction	0.1184%
E-Benzene wt Fraction	0.0047%
Xylene wt Fraction	0.0247%
n-Hexane wt Fraction	0.8398%
2,2,4-Trimethylpentane wt Fraction	0.0000%
HAP Emission Factor	0.002 tpy/bopd
CH4 wt Fraction	2.33%

CRITERIA POLLUTANT EMISSIONS

VOCs (PTE for all tanks):

					DRE		
0.139 TPY VOC/BOPD	x	1414 BOPD	x	98%	=	3.93 TPY

VOCs (PTE per tank):

3.930 TPY for 8 Tanks	/	12 Tanks	=	0.33 TPY per Tank

VOC PTE per tank is less than 6 tpy; however the tanks are affected sources under NSPS OOOOa due to construction/modification of the Wetterhorn Pad after September 18, 2015.

Bruin E&P Operating, LLC

Sadowsky 14-11-2H

Tanks

Flare Gas Volume	13,009	scf/day
Lower Heating Value	2000	Btu/scf
Molecular Weight	45.19	lb/lb-mole
VOC wt Fraction	79.80%	
HAP wt Fraction	2.26%	

Controlled emissions are calculated based on a 98% destruction efficiency of the VOC gas.

VOCs (PTE for all tanks)

									DRE			
VOC:	642	scf/hr	x	1/379 scf/lb-mole	x	45.19 lb/lb-mole	x	79.80%	x	98%	=	1.03 lb/hr
	1.03	lb/hr	x	6760 hr/yr	x	1 ton/2000 lb	x		x	98%	=	4.52 TPY

VOCs (PTE per tank)

VOC:	4.52	TPY	/	4 Tanks	=	1.13 TPY per Tank

VOC PTE per tank is less than 6 tpy, however the tanks are affected sources under NSPS OOOOa due to the construction/modification of the Sadowsky Pad after September 18, 2015.

Bruin E&P Operating, LLC 2018-2019: OOOOa Annual Report

Attachment 5: Flare Inspection Summary Log

Bruin E&P Operating, LLC Flare Inspection Summaries 10/30/2019

Pad Name	Month	Date	Inspector	60.5417(h)(1)(ii) Control Device Smoke?	60.5417(h)(1)(ii) Confirmed w/Method 22	60.5417(h)(1)(ii) Flare Repaired?	60.5417(h)(1)(i) Control Device (Pilot Out?)	60.5417(h)(1)(i) Pilot Repaired?	Commets/Corrective Actions	Corrective Actions Completion Date
Anderson	Aug-18	8/22/2018	Julia Traster				No		Initial inspection	
	Dec-18	12/31/2018	Bailey Ketelsen				NO		Verified no opacity.	
	Jan-19	1/25/2019	Bailey Ketelsen				No		Verified no opacity.	
	Jun-19	6/25/2019	Bailey Ketelsen				No		Verified no opacity.	
Berg Trust Federal 26A	Dec-19	12/31/2018	Bailey Ketelsen				No		Verified no opacity.	
	Jun-19	6/27/2019	Bailey Ketelsen				No		Verified no opacity.	
Bross	Aug-17	8/22/2017	Julia Traster				NO		Verified no opacity	
	Jan-18	1/18/2018	Julia Traster				NO		Verified no opacity	
	Jun-18	6/8/2018	Julia Traster				NO		Verified no opacity	New Steffes flare installed 7/31/18
	Jan-19	1/22/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/18/2019	Bailey Ketelsen				No		Verified no opacity	
Cameron	Mar-19	3/19/2019	Bailey Ketelsen				NO		Verified no opacity. Initial inspection.	
	Jun-19	6/27/2019	Bailey Ketelsen				No		Verfied no opacity.	
California	Jan-19	1/31/2019	Bailey Ketelsen				NO		Verified no opacity. Initial inspection.	
	Jun-19	6/25/2019	Bailey Ketelsen				No		Verified no opacity.	

Bruin E&P Operating, LLC Flare Inspection Summaries 10/30/2019

				60.5417(h)(1)(ii)			60.5417(h)(1)(i)			
Pad Name	Month	Date	Inspector	Control Device Smoke?	Confirmed w/Method 22	Flare Repaired?	Control Device (Pilot Out?)	Pilot Repaired?	Commets/Corrective Actions	Corrective Actions Completion Date
Handies	Aug-17	8/23/2017	Julia Traster	YES	YES		NO			
	Jan-18	1/25/2018	Julia Traster				NO		Verified no opacity	
	Jun-18	6/13/2018	Julia Traster	YES	YES		NO			Steffes flare maintenance done 8/28/2018
	Jan-19	1/22/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/18/2019	Bailey Ketelsen				No		Verified no opacity	
LaPlata	Aug-17	8/28/2017	Julia Traster				NO		Verified no opacity	
	Jan-18	1/19/2017	Julia Traster				NO		Verified no opacity	
	Jun-18	6/14/2018	Julia Traster				NO		Verified no opacity	Steffes flare maintenance done 7/31/2018
	Jan-19	1/29/2019	Bailey Ketelsen				N/A		Pad shut in for Frac protect	
	Jun-19	6/22/2019	Bailey Ketelsen				No		Verified no opacity	
Little Bear	Jan-19	1/30/2019	Bailey Ketelsen				No		Verified no opacity. Initial inspection	
	Jun-19	6/18/2019	Bailey Ketelsen				NO		Verified no opacity	
Lincoln	Jun-19	6/25/2019	Bailey Ketelsen				NO		Verified no opacity. Initial inspection	

Bruin E&P Operating, LLC Flare Inspection Summaries 10/30/2019

Pad Name	Month	Date	Inspector	60.5417(h)(1)(ii) Control Device Smoke?	60.5417(h)(1)(ii) Confirmed w/Method 22	60.5417(h)(1)(ii) Flare Repaired?	60.5417(h)(1)(i) Control Device (Pilot Out?)	60.5417(h)(1)(i) Pilot Repaired?	Commets/Corrective Actions	Corrective Actions Completion Date
Longs	May-18	N/A					N/A		First oil May 2018	
	Jul-18	7/30/2018	Julia Traster				NO		Verified no opacity	
	Nov-19	11/19/2018	Bailey Ketelsen				NO		Verified no opacity	
	Jan-19	1/25/2019	Bailey Ketelsen				NO		Verified no opacity	
	Jun-19	6/25/2019	Bailey Ketelsen				No		Verified no opacity	
Pikes/Ouray	Aug-17	8/28/2017	Julia Traster	YES	YES		NO			
	Jan-18	1/19/2018	Julia Traster				NO		Verfied no opacity	
	Jun-18	6/18/2018	Julia Traster	YES	YES		NO			New Steffes flares installed 7/6/2018
	Jan-19	1/29/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/26/2019	Bailey Ketelsen				No		Flame arrestor cleaned out	
Phoenix	Aug-17	N/A					N/A		Well still drilling or on flowback	
	Jan-18	1/23/2018	Julia Traster				NO		Verified no opacity	Made adjustments on the Steffes blower. Cleaned DFA.
	Jun-18	6/21/2018	Julia Traster				NO		Verified no opacity	New Steffes flares installed 5/3/2018
	Jan-19	1/15/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/24/2019	Bailey Ketelsen				No		Verified no opacity	

Bruin E&P Operating, LLC Flare Inspection Summaries 10/30/2019

Pad Name	Month	Date	Inspector	60.5417(h)(1)(ii) Control Device Smoke?	60.5417(h)(1)(ii) Confirmed w/Method 22	60.5417(h)(1)(ii) Flare Repaired?	60.5417(h)(1)(i) Control Device (Pilot Out?)	60.5417(h)(1)(i) Pilot Repaired?	Commets/Corrective Actions	Corrective Actions Completion Date
Pyramid	Aug-17	8/23/2017	Julia Traster	YES	YES		NO		North Tank Battery (NTB) flare only	
	Jan-18	1/18/2018	Julia Traster	YES	YES		NO		NTB flare only	Cleaned DFA's.
	Jun-18	6/13/2018	Julia Traster			YES	NO		Verified no opacity	New Steffes flares installed 6/7/2018
	Jan-19	1/30/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/25/2019	Bailey Ketelsen				YES	Yes	Low pressure flare relit by lease operator	
Sadowsky 14	Jun-18	6/12/2018	Michelle Decker				NO		Verified no opacity	
	Oct-19	10/10/2018	Michelle Decker				No		Verified no opacity	
	Jan-19	1/31/2019	Michelle Decker				No		Verified no opacity	
	Jun-19	6/21/2019	Michelle Decker				No		Verified no opacity	
San Luis/Alamosito	Aug-17	8/22/2017	Julia Traster				NO		Verified no opacity	
	Jan-18	1/18/2018	Julia Traster				NO		Verified no opacity	
	Jun-18	6/8/2018	Julia Traster	YES	YES		NO			New Steffes flares installed 7/13/2018
	Jan-19	1/16/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/19/2019	Bailey Ketelsen				No		Verified no opacity	
Sneffels	Aug-17	8/22/2017	Julia Traster				NO		Verified no opacity	Steffes blower under construction
	Jan-18	1/18/2018	Julia Traster	YES	YES		NO			Removed and cleaned DFA's.
	Jun-18	6/13/2018	Julia Traster			YES	NO		Verified no opacity	Zeeco flare replaced with Steffes flares 6/18/18
	Jan-19	1/30/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/24/2019	Bailey Ketelsen				No		Verified no opacity	

Bruin E&P Operating, LLC Flare Inspection Summaries 10/30/2019

Pad Name	Month	Date	Inspector	60.5417(h)(1)(ii) Control Device Smoke?	60.5417(h)(1)(ii) Confirmed w/Method 22	60.5417(h)(1)(ii) Flare Repaired?	60.5417(h)(1)(i) Control Device (Pilot Out?)	60.5417(h)(1)(i) Pilot Repaired?	Commets/Corrective Actions	Corrective Actions Completion Date
Stewart	Aug-17	8/28/2017	Julia Traster				NO		Verified no opacity	
	Jan-18	1/19/2018	Julia Traster				NO		Verified no opacity	Replaced flame arrestor element, Steffes flare missing part of the ball.
	Jun-18	6/18/2018	Julia Traster				NO		Verified no opacity	Steffes flare repairs made 7/25/18
	Jan-19	1/24/2019	Bailey Ketelsen				No		Verified no opacity	drained pilot line, cleaned y-strainer, cleaned orifice
	Jun-19	6/26/2019	Bailey Ketelsen				No		Verified no opacity	
Sunlight	Aug-17						NO		Well still drilling or on flowback	
	Jan-18	1/19/2018	Julia Traster	YES	YES		NO		Verified no opacity	Separators started, blower added, changed out all thief hatches.
	Jun-18	6/14/2018	Julia Traster	YES	YES		NO		Opacity on high capacity flare only, none on air assist flare	Checked blower
	Jan-19	1/29/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/26/2019	Bailey Ketelsen				No		Verified no opacity	
Vermejo	Aug-17	8/28/2017	Julia Traster				NO		Verified no opacity	Petroptics repaired #2091
	Jan-18	1/19/2018	Julia Traster				NO		Verified no opacity	
	Jun-18	6/18/2018	Julia Traster	YES	YES		NO			New Steffes flare installed 8/2/2018
	Jan-19	1/29/2019	Bailey Ketelsen				Yes	Yes	Flare not lit, low pilot temp.	Pilot line blown out, pilot lit 2/3/19
	Jun-19	6/26/2019	Bailey Ketelsen				No		Verified no opacity	

Bruin E&P Operating, LLC Flare Inspection Summaries 10/30/2019

Pad Name	Month	Date	Inspector	60.5417(h)(1)(ii) Control Device Smoke?	60.5417(h)(1)(ii) Confirmed w/Method 22	60.5417(h)(1)(ii) Flare Repaired?	60.5417(h)(1)(i) Control Device (Pilot Out?)	60.5417(h)(1)(i) Pilot Repaired?	Commets/Corrective Actions	Corrective Actions Completion Date
Wetterhorn	Aug-17	8/28/2017	Julia Traster				N/A		Wells down for frac	
	Jan-18	1/25/2018	Julia Traster	YES	YES		NO			
	Jun-18	6/13/2018	Julia Traster	YES	YES		NO			
	Jan-19	1/25/2019	Bailey Ketelsen				NO		Verified no opacity	
	Jun-19	6/24/2019	Bailey Ketelsen				NO		Verified no opacity	
Wilson	Aug-17	8/22/2017	Julia Traster				NO		Verified no opacity	
	Jan-18	1/18/2018	Julia Traster	YES	YES					DFA cleaned out in the spring
	Jun-18	6/11/2018	Julia Traster				NO		Verified no opacity	Wells down for frac protect/flowback - July 2018
	Jan-19	1/22/2019	Bailey Ketelsen				No		Verified no opacity	
	Jun-19	6/24/2019	Bailey Ketelsen				NO		Verified no opacity	
Windom	Aug-17	8/23/2017	Julia Traster				NO		Verified no opacity	
	Jan-18	1/18/2018	Julia Traster	YES	YES		NO		Verified no opacity	DFA must be plugged or some other obstruction in line
	Jun-18	6/13/2018	Julia Traster	YES	YES		NO		Verified no opacity	New Steffes flare installed 7/20/18
	Jan-19	1/15/2019	Bailey Ketelsen				NO		Verified no opacity	
	Jun-19	6/25/2019	Bailey Ketelsen				NO		Verified no opacity	

Bruin E&P Operating, LLC 2018-2019: OOOOa Annual Report

Attachment 6: Steffes Flare Manuals

Bruin E&P Operating LLC - Steffes flare serial numbers by pad 10/30/18

LOCATION	Low Pressure / SCVG	High Pressure / SCHP	High Capacity / SCHC	Pilot / SPL	Large Air Assist / SCAA-4	Small Air Assist / SCAA-2
Anderson Pad			698, 696, 694, 695	200025, 200026	0086	
Bierstadt Pad	00592R		0526	101270		
Blanca Pad	01231R	0388R		unknown		
Bross Pad	01250R, 01251R	0389R, 0382R		100752, 100119		
Evans Pad	0390R	100581		100744		
Handies Pad	01364R		0860	100506		
Longs Pad			1079, 1076, 1087, 1054	200385, 200383	0052	
Oklahoma Pad	105148, 105141	0398R, 0403R		200555, 200544		
Phoenix Pad			0199	unknown	0048	
Pikes-Ouray Pad	01205R	0371R		100492		
Princeton Pad	01211R	0396R		100485		
Pyramid Pad			1290, 1291, 1294, 1295	200577, 200576	0204	
SanLuis-Alamosito Pad	104738, 101953	0391R, 0394R, 0392R		101096, 10010		
Sherman Pad	01194R	00372R		unknown		
Sneffels Pad			1138	200460	0168	
Snowmass Pad	01193R	0377R		unknown		
Sunlight Pad			1062	00316	0155	
Sunshine Pad	01266R, 01260R	0378R, 0390R		10010, 101096		
Tabegauche Pad	01219R	0373R		10103		
Vermejo Pad	105161	0407R, 0393R		105646		
Wetterhorn Pad	0828R		0819, 0516	100497		
Windom Pad			1237, 1236, 1234, 1238	200537, 200538	0186	
Yale Pad	01191R	0386R		unknown		

Bruin E&P Operating, LLC 2017-2018: OOOOa Annual Report

Attachment 6: Steffes Flare Manuals

Document # 1202000
ECO # 153359 REV # 6

STEFFES CORPORATION

Engineered Flare Installation, Operation and Maintenance Manual

INCLUDES MODELS: SHC-6, SHP-6, SVG-3, SPC-1

Steffes Corporation | 3050 Hwy 22 N | Dickinson, ND 58601 | 701-483-5400 | www.steffes.com

WARRANTY POLICY

ENGINEERED FLARE

Steffes Corporation ("Steffes") warrants its oil field products are free from defects in materials and workmanship under normal use and service. Steffes' obligation under this Warranty is limited to the replacement of part(s) which prove to be defective under normal use within **1 year** of the date of installation, and which Steffes' examination of the returned part(s) shall verify to Steffes' satisfaction that it is defective.

Steffes shall in no event have obligations or liabilities to customer or any other person for loss of profits, loss of use or incidental, special or consequential damages, whether based on contract, tort (including negligence), strict liability, or any other theory or form of action, arising out of the sale and use of its oil field products. Without limiting the generality of the preceding sentence, Steffes shall not be liable for personal injury or property damage. In no event shall the liability of Steffes exceed the actual amount paid by customer for the oil field product.

This Warranty is void if the oil field product is moved from the premises in which it was originally installed. This Warranty shall not apply to the oil field product which has been altered in any respect, or improperly installed, serviced or used, or has been subject to accident, negligence, abuse or misuse. This warranty does not cover corrosion of the oil field product.

THE ABOVE WARRANTY BY STEFFES IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

IMPORTANT

- These installation instructions are only to be used as a guideline. It is the purchaser's/ installer's responsibility to assess the suitability of this product for their specific installation.

- The installation instructions may change without notice. Please contact the factory to make sure you have the most up-to-date installation instructions.

- To insure proper installation and operation of this product, completely read all instructions prior to attempting to assemble, install, operate, maintain or repair this product. Upon unpacking of the system, inspect all parts for damage prior to installation and start up. Improper installation can result in injury and void warranty.

- The equipment described herein is intended for installation by qualified personnel in accordance with applicable local, state, and federal laws and requirements.

- Disclaimer: In compiling this manual, Steffes Corporation has used its best judgment based upon information available, but disclaims any responsibility or liability for any errors or miscalculations contained herein, or any revisions hereof, or which result, in whole or in part, from the use of this manual or any revisions hereof.

DANGER

FLAMMABLE GAS PRESENT: Risk of Explosion. Installation and/or servicing of equipment restricted to authorized personnel only.

HAZARDOUS VOLTAGE: Risk of electric shock. Can cause injury or death. Disconnect all remote electrical power supplies, turn off switch, and remove fuses before servicing and be aware of sparking ignition system.

Follow all safety requirements of the work site including any and all personal protective equipment (PPE) requirements.

Read and understand manual before installing and/or servicing equipment.

Table of Contents

DESCRIPTION

The Steffes Engineered Flare is intended for burning high pressure and/or low pressure waste gas on production oil sites. It was designed to help operators meet the requirements set forth in EPA 40 CFR 60.18.

It is the responsibility of the operator to properly plumb the engineered flare on site. Following are some items that need to be considered in the plumbing:

1. Pressure rating of the pipe to the flare needs to be at least as high as the pressure setting of the safety relief on the system. On a typical system, this would be the rating of the thief hatches and the safety relief on the treater.
2. Properly sized detonation arrestors need to be in the pipes leading to the flare.
3. Properly sized liquid knockouts need to be included in system to prevent freeze-up and to prevent excessive fluid from being sent to the flare.
4. Heat radiation of flare will be dependent on many factors such as flow rate, gas composition, wind, etc. and must be considered when positioning flare relative to equipment and personnel onsite.

START-UP

1. Read all manuals prior to start-up.
2. Verify no gas is present at the flare.
3. Verify flare tip(s) are free to move. On the smaller flare, lift the ball approximately 1/16" and verify it goes down freely. If you lift higher than 1/16", you may need to spin the ball to get it to seat properly. Because of the weight of the large tip, verify the tip is free to move by rotating it by hand, side to side.
4. Verify that pilot gas supply line has been purged, and pilot orifice is not plugged.
5. Verify good spark quality at pilot igniter.
6. Turn on gas to pilot and confirm good quality flame at pilot

SPECIFICATIONS

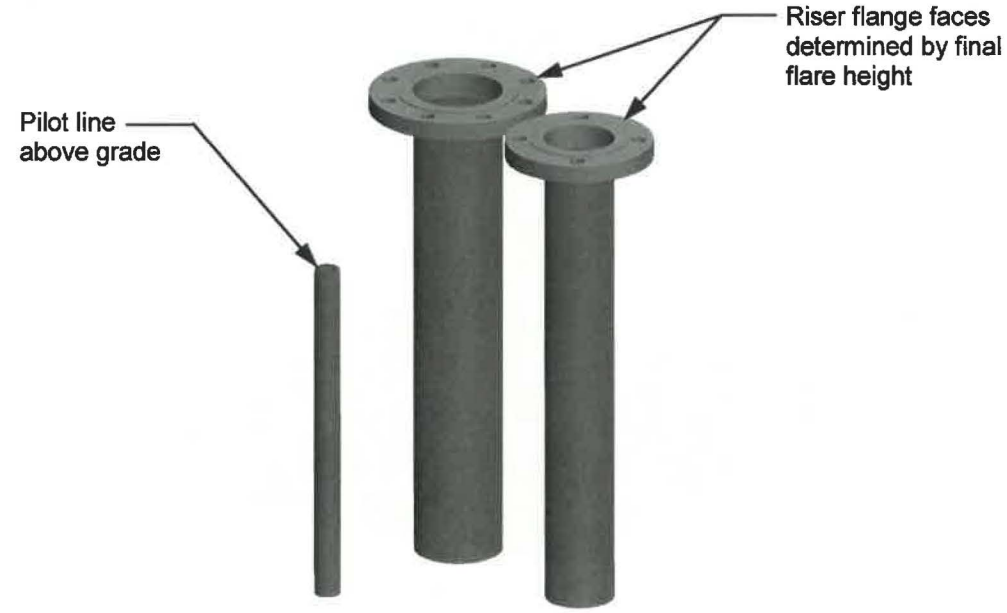
High Pressure		Low Pressure flare Tip	Pilot
Standard Capacity Flare Tip	High Capacity Flare Tip		
Model: SHP-6 **Max Flow Rate:** 1.1 MMSCFD* **Weight:** 200 lbs	**Model:** SHC-6 **Max Flow Rate:** 3.0 MMSCFD* **Weight:** 230 lbs	**Model:** SVG-3 **Max Flow Rate:** 106 MSCFD* **Weight:** 70 lbs	**Model:** SPL-1 **Gas Flow Rate:** Pilot orifice is a #70 MTD Propane at 8 PSI is 11 Cu. Ft./Hr.* Propane at 10 PSI is 13 Cu. Ft./Hr.* **Weight:** 15 lbs Multiply flow by 1.6 for natural gas

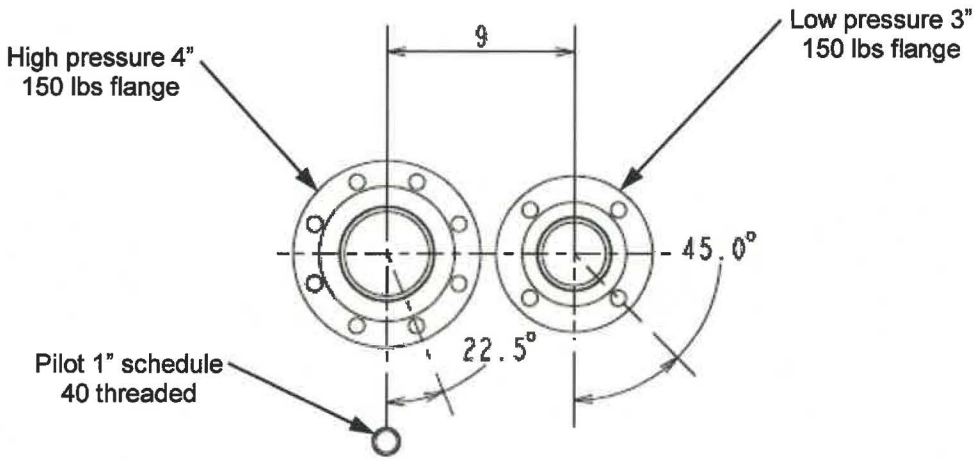
Date is for reference only. Call factory for more specifics

SITE PREPARTION

The high pressure flare and low pressure flare risers need to be 9" apart center to center. Steffes provides a template upon request. Location of pilot line is not critical, providing it is located no further than 18" from either riser centerline (applies only if not using a flare base).

The pilot supply line from the treater should be 1" pipe or larger, and include the following components; gas scrubber, ball valve, pressure regulator and pressure gauge (all supplied by customer).



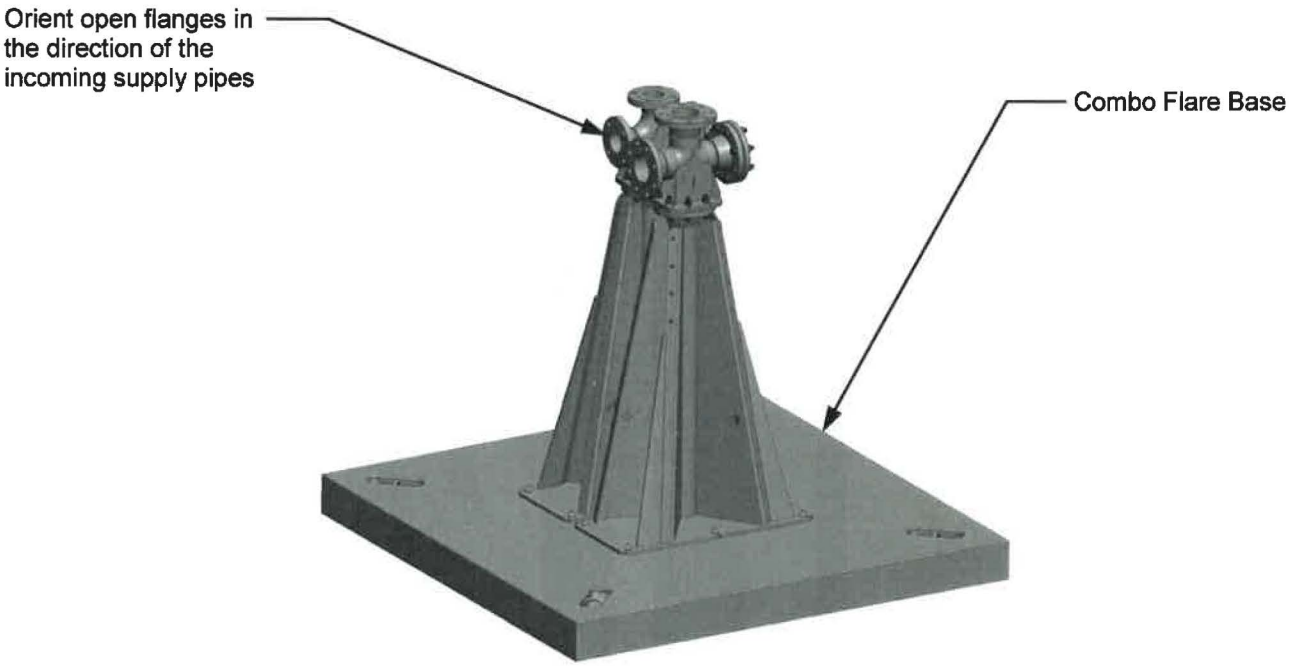


*Prior to installation of flare, check that all gas lines are clean and free of liquids or debris.

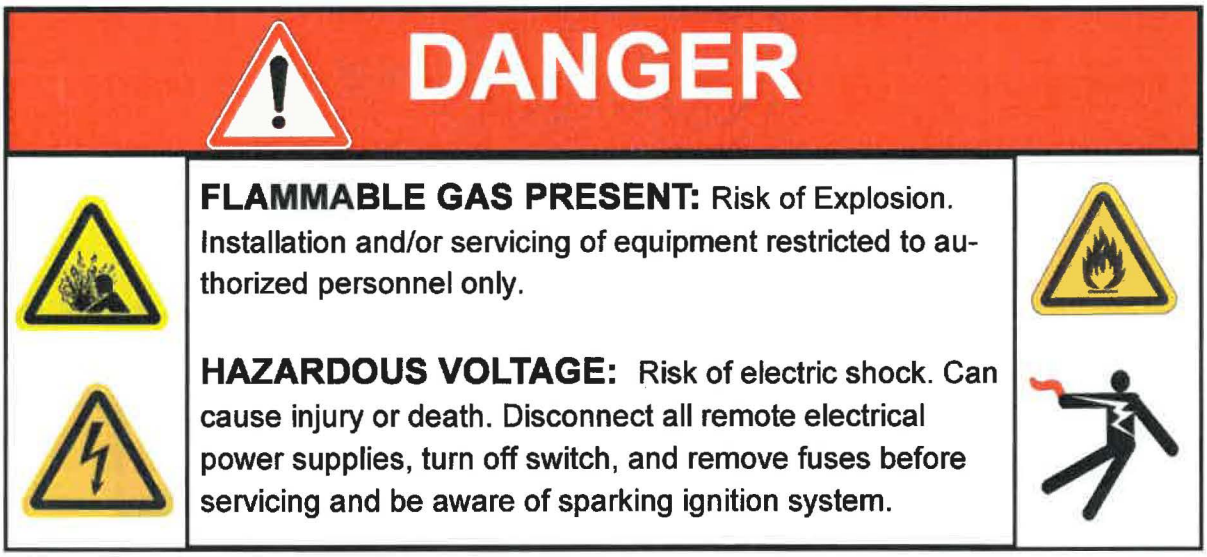
DANGER

FLAMMABLE GAS PRESENT: Risk of Explosion. Installation and/or servicing of equipment restricted to authorized personnel only.

When using a flare base, there is no need for a template. Place the base on flat, level, stable ground in desired location. The base elevates the center of the high pressure flange to 60" and the center of the low pressure flange to 61" from the ground. It is best practice to have the 1" pilot line as close to the flare as possible, commonly run alongside or between the supply lines.



*Prior to installation of flare, check that all gas lines are clean and free of liquids or debris.



HIGH PRESSURE INSTALL

***Numbers indicate recommended assembly order.**

Orient flare so the pressure gauge port points in the direction of the incoming pipes.

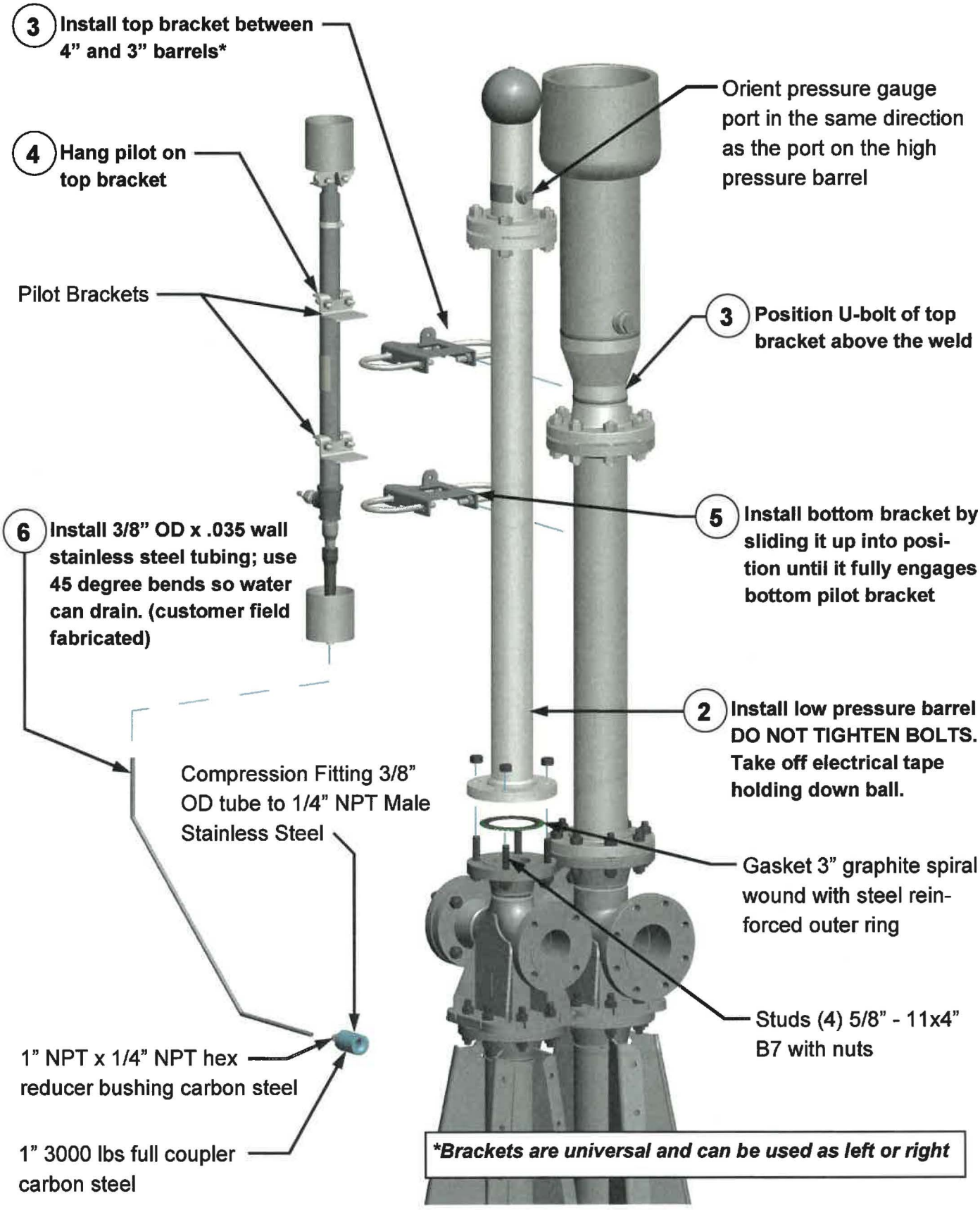
1 **Install the high pressure main barrel —torque bolts to 90 ft-lbs**

Gasket 4" spiral wound graphite with steel outer ring

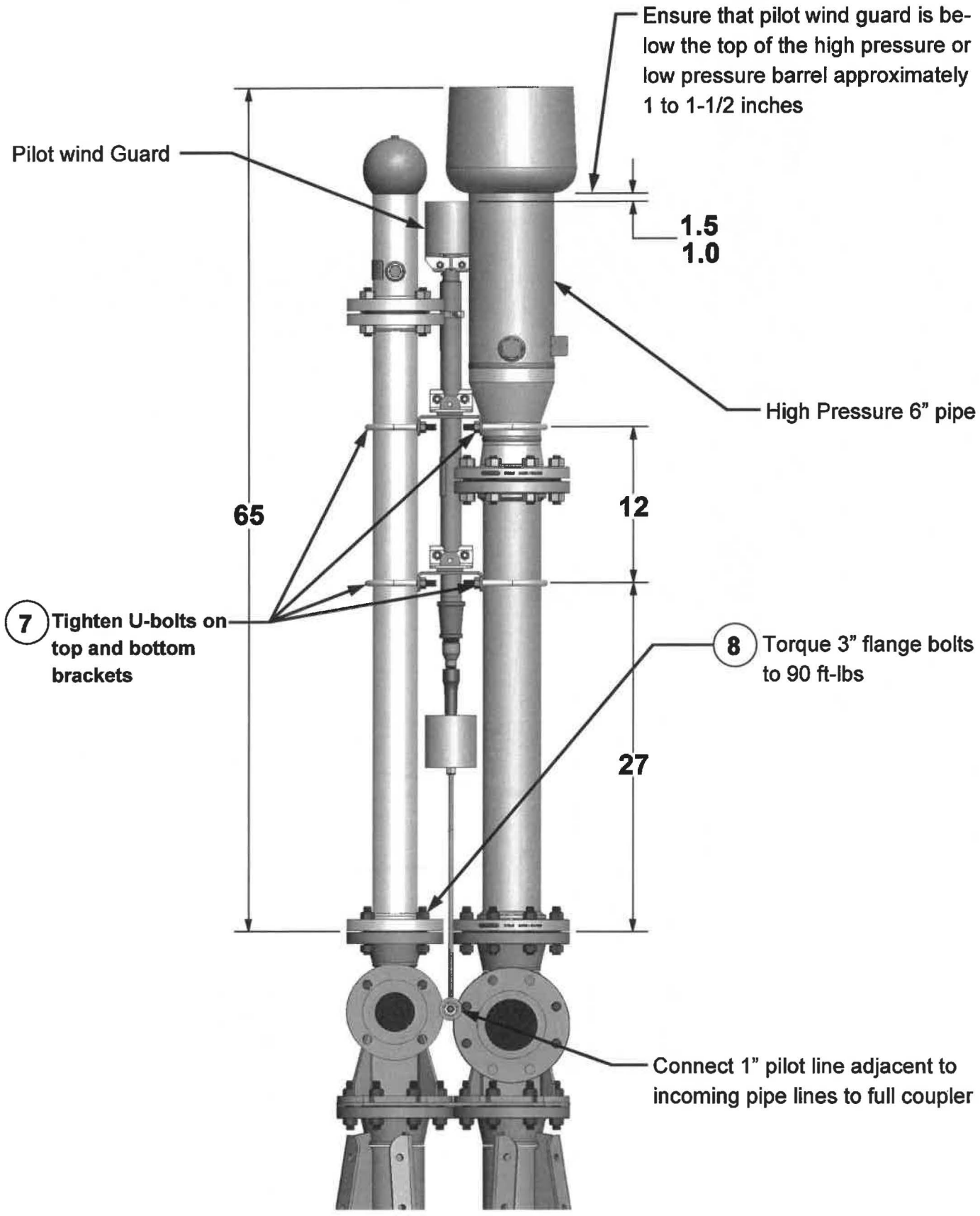
Studs (8) 5/8"-11x4" B7 with nuts

Combo flare base assembly

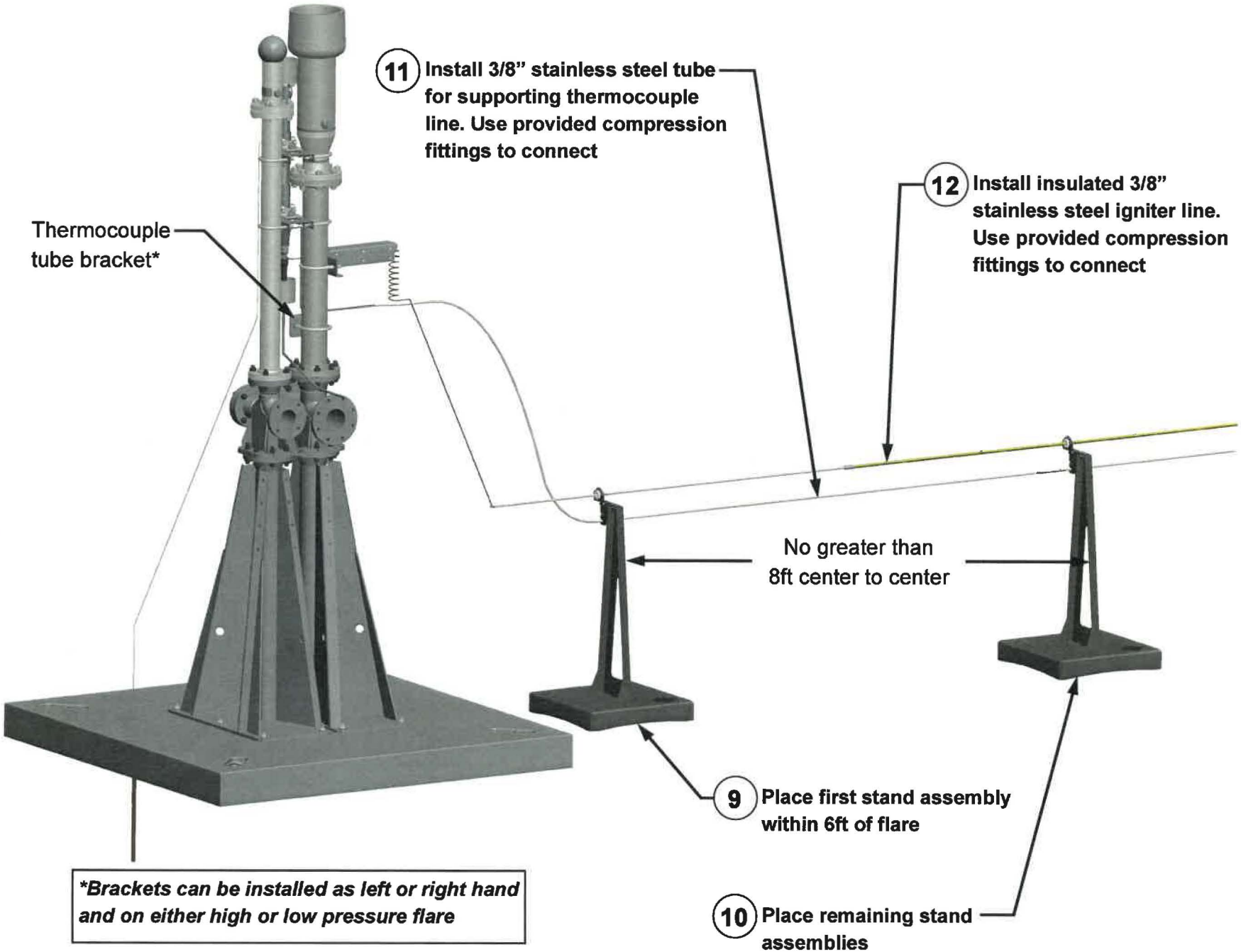
LOW PRESSURE AND PILOT INSTALL

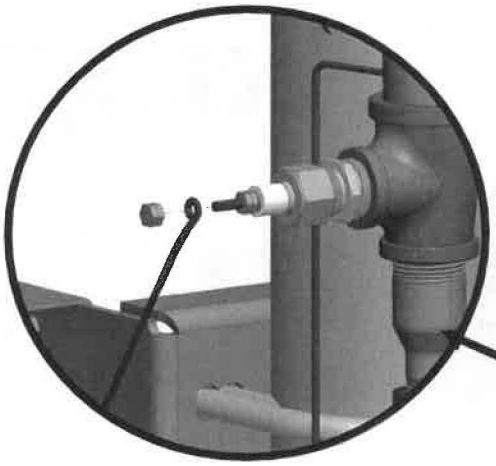


PILOT INSTALL (cont.)



INSTALLING STANDS AND LINES





Detail 1: Connection of Pilot to ignition line

Connect ground using Kanthal wire only due to the high heat in flare pit

Install insulator bracket and heat shield assembly between the thermocouple bracket and the bottom pilot bracket (heat shield should be on top)

Route the thermocouple probe through the brackets (no sharp bends, do not cut)

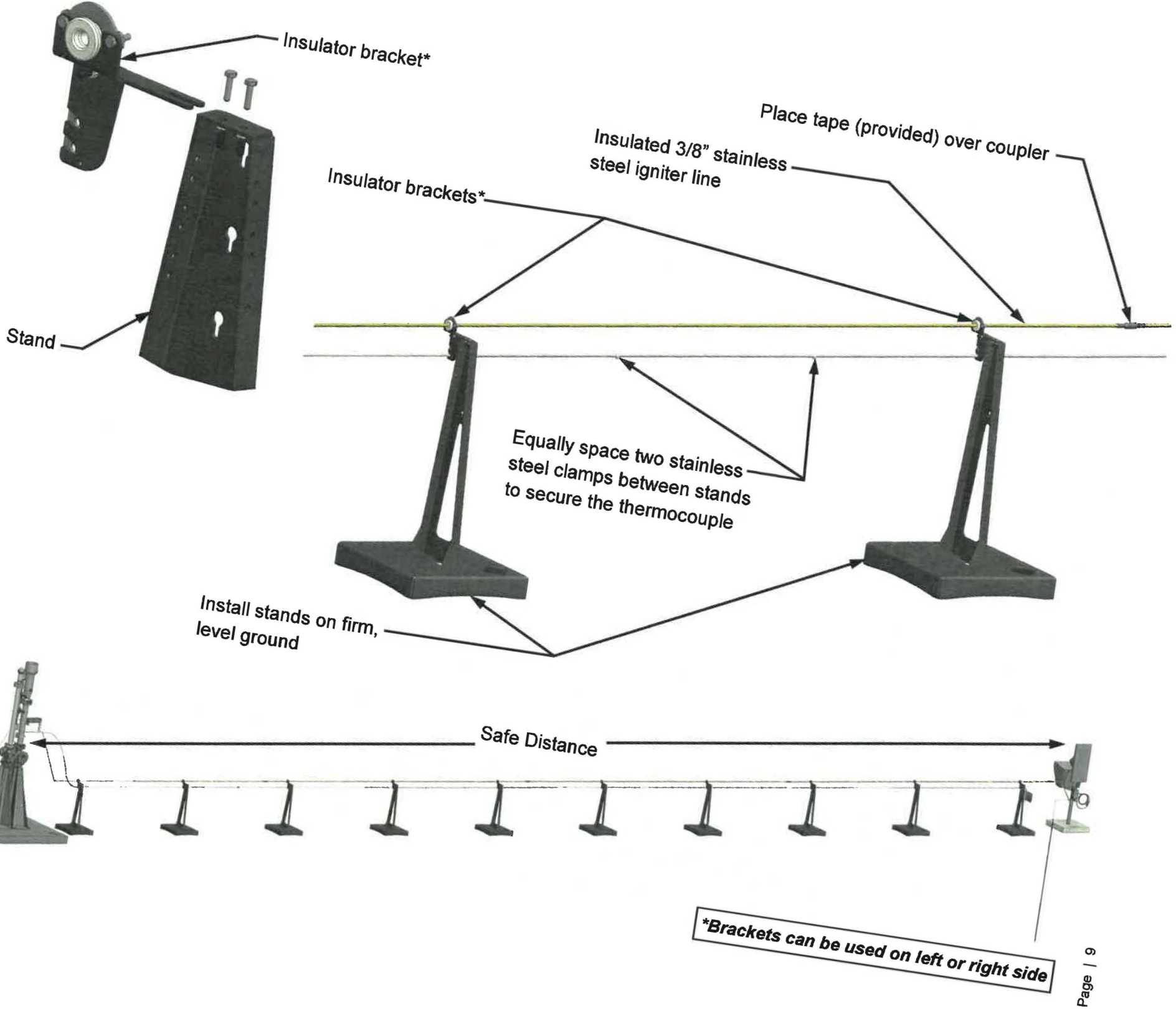
Connect kanthal wire to ignition line (cannot touch other metal surfaces)

3/8" stainless steel tubing to support the thermocouple line

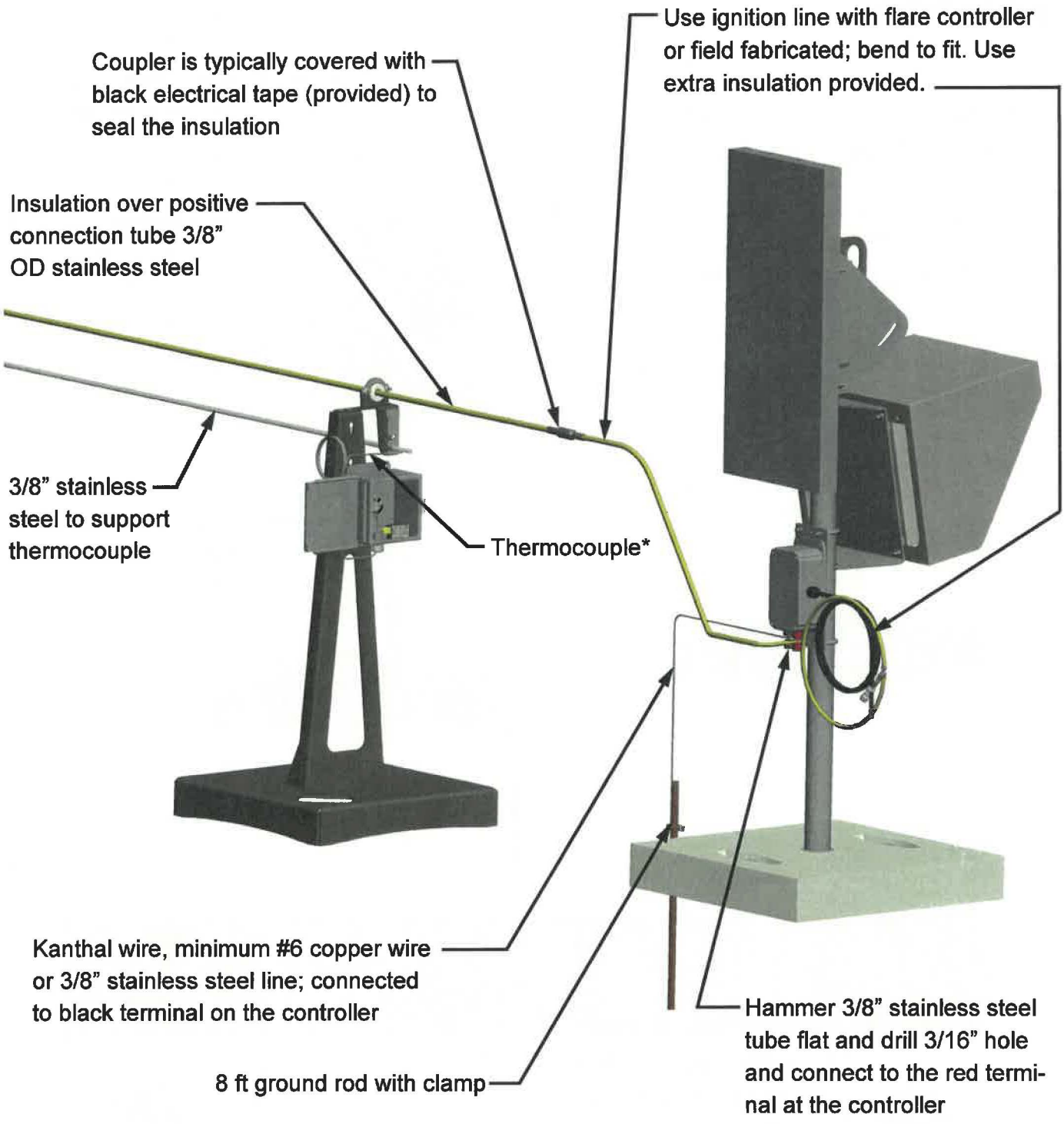
Hammer 3/8" stainless steel tube flat and drill 3/16" hole; connect to kanthal

Detail 2: Connection of Kanthal wire to ignition line

***Brackets can be installed as left or right hand and on either high or low pressure flare**


Insulator bracket*
Stand
Place tape (provided) over coupler
Insulated 3/8" stainless steel igniter line
Insulator brackets*
Equally space two stainless steel clamps between stands to secure the thermocouple
Install stands on firm, level ground
Safe Distance
*Brackets can be used on left or right side

FLARE CONTROLLER INSTALL

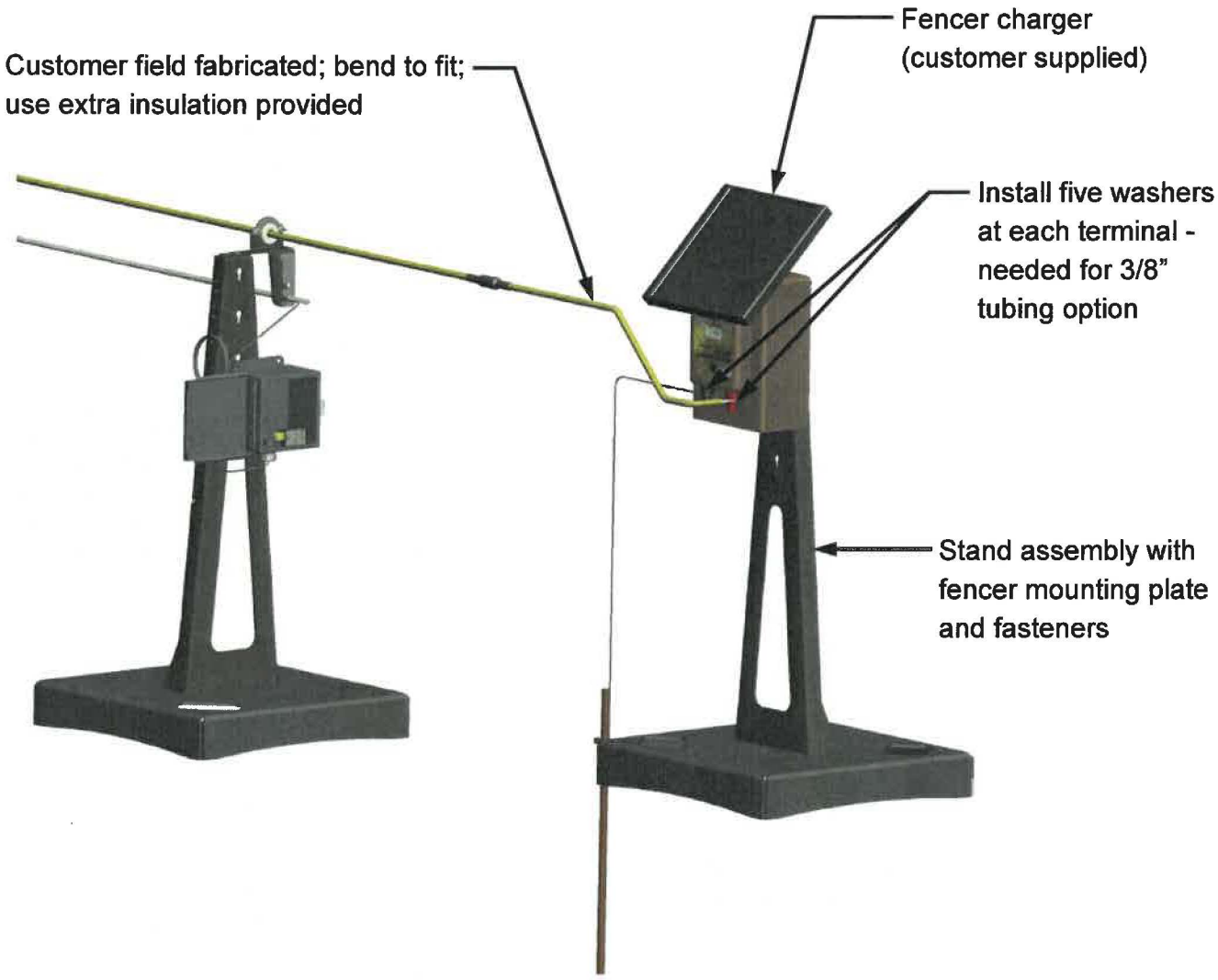


* The probe end is a closed tube, 50 feet long (if the closed tube gets cut, bent sharply or broke, it will need to be replaced). The probe is connected to a lead, which is 50 feet long and covered with braided stainless steel sheathing.

Careful when uncoiling the thermocouple—especially the stainless steel braided end, as it can easily become tangled.

FENCER INSTALL

(OPTIONAL)

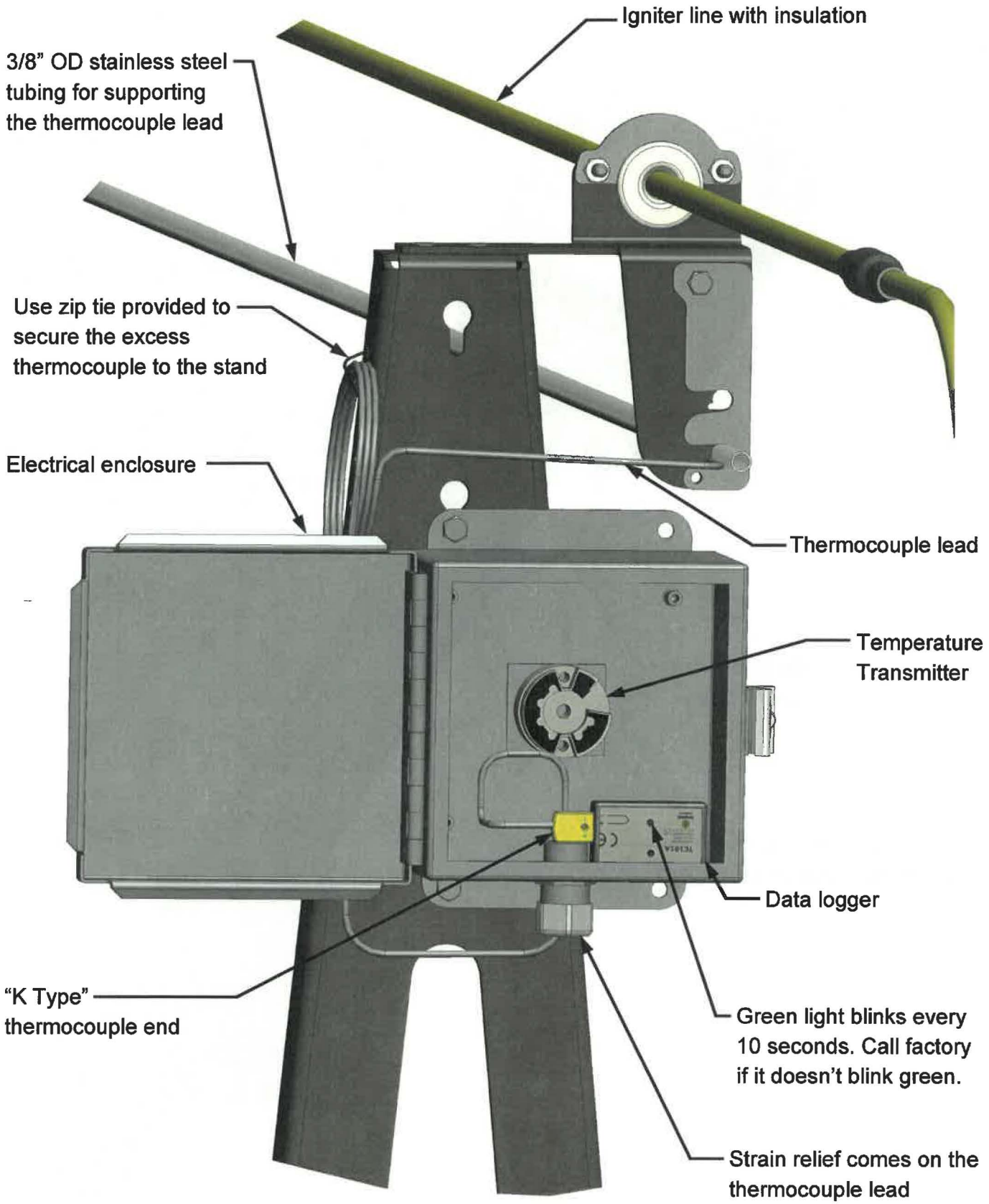


DANGER

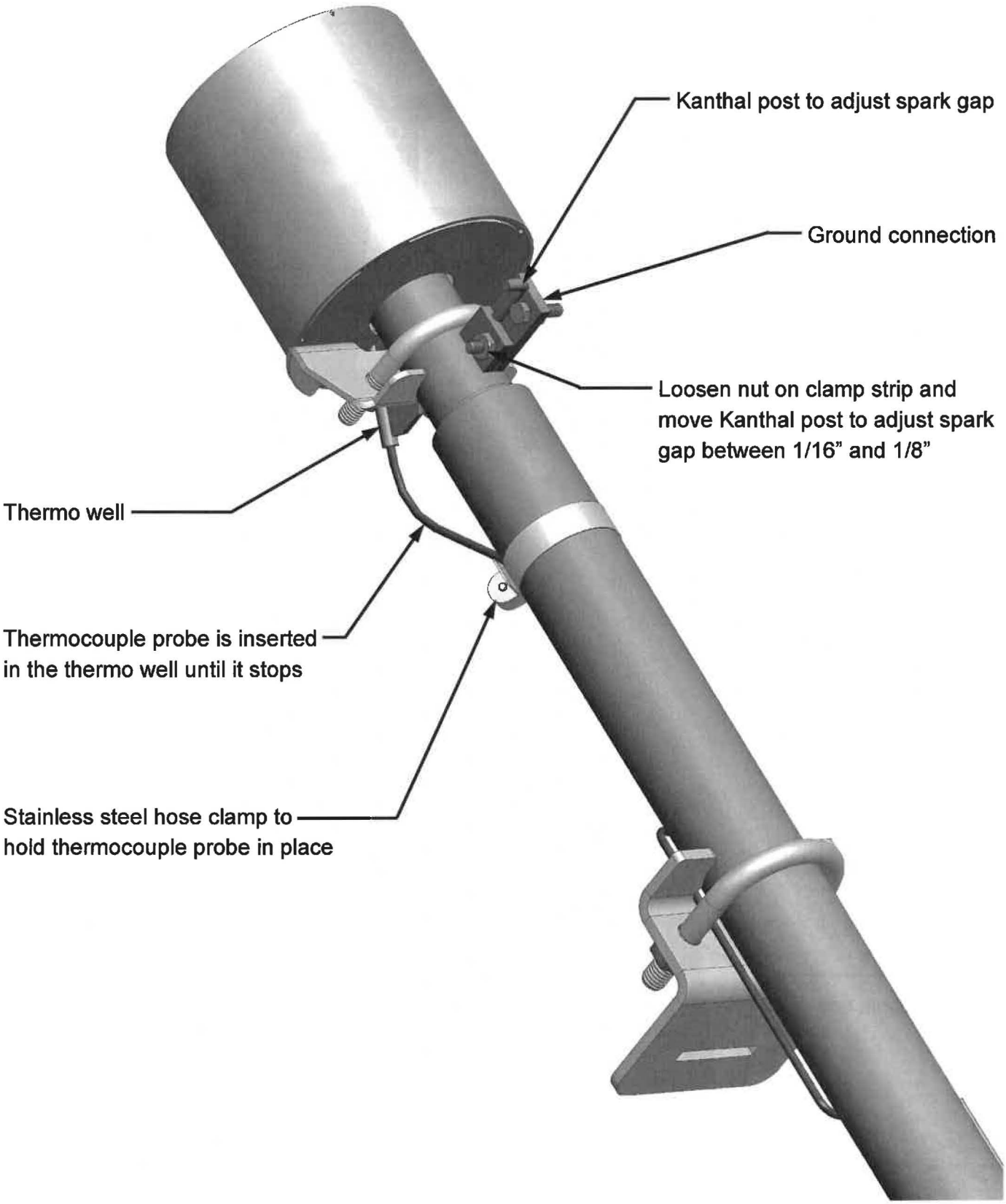
FLAMMABLE GAS PRESENT: Risk of Explosion. Installation and/or servicing of equipment restricted to authorized personnel only.

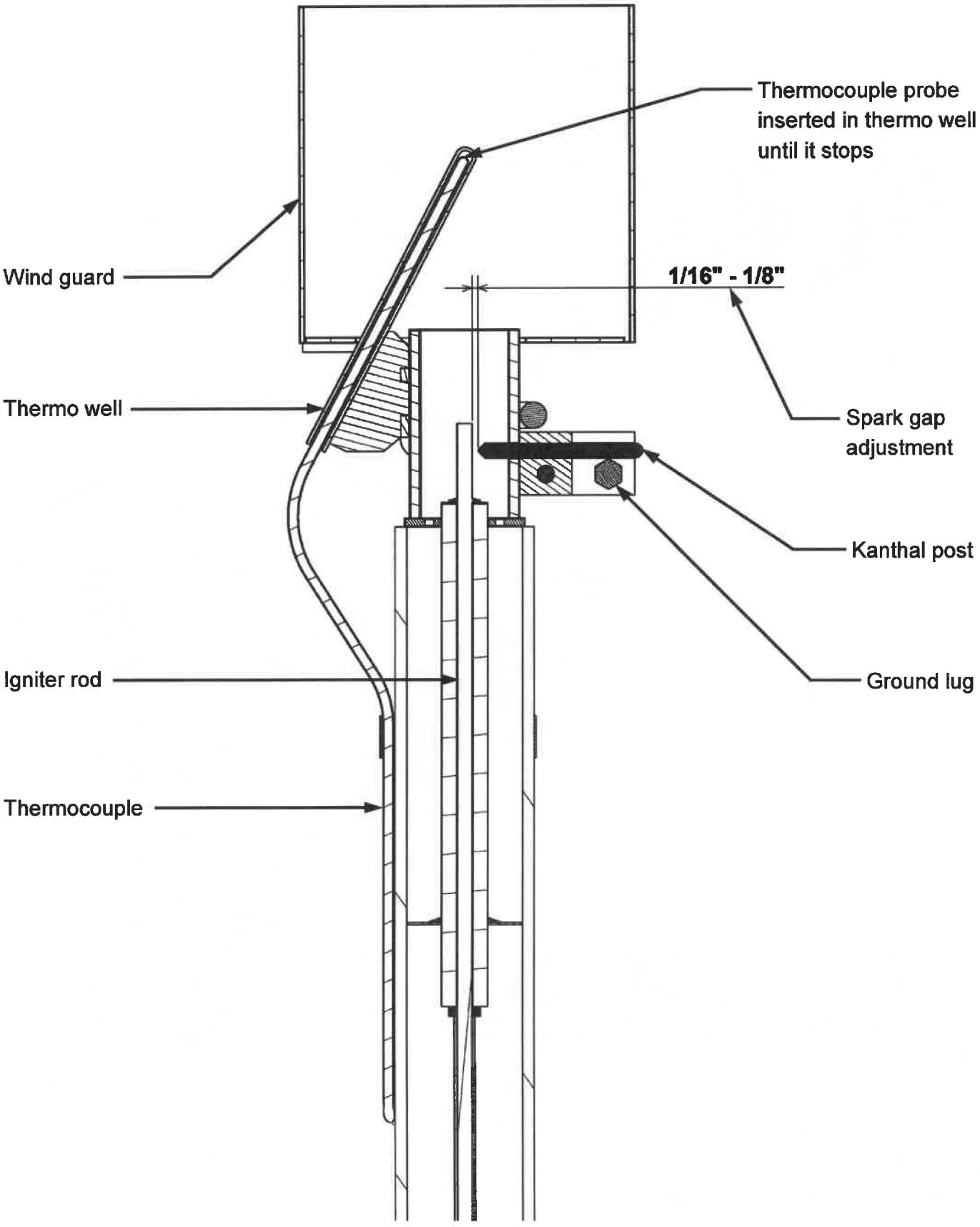
HAZARDOUS VOLTAGE: Risk of electric shock. Can cause injury or death. Disconnect all remote electrical power supplies, turn off switch, and remove fuses before servicing and be aware of sparking ignition system.

ELECTRICAL ENCLOSURE

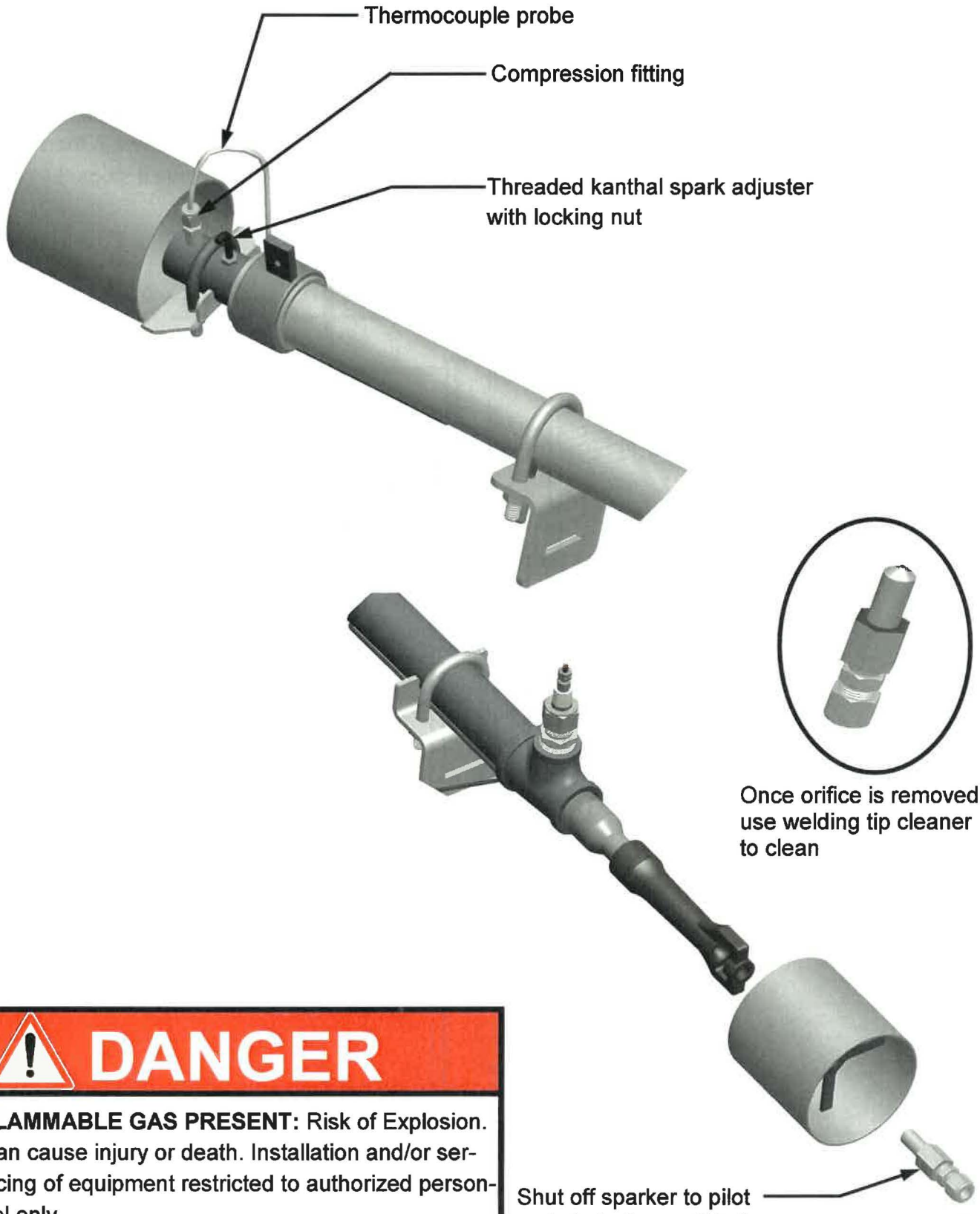


PILOT SPARK GAP AND THERMOCOUPLE




Thermocouple probe inserted in thermo well until it stops
Wind guard
1/16" - 1/8"
Thermo well
Spark gap adjustment
Kanthal post
Ground lug
Igniter rod
Thermocouple

CLEANING THE ORIFICE



DANGER

FLAMMABLE GAS PRESENT: Risk of Explosion. Can cause injury or death. Installation and/or servicing of equipment restricted to authorized personnel only.

Shut off all gas prior to working on flare.

TROUBLESHOOTING

SYMPTOM	POTENTIAL SITUATIONS	RECOMMENDED ACTION
Pilot will not spark	Fencer/Controller not turned on or bad connection	Turn fencer/controller on, should hear a snap. Make sure to hear clicking internally. Check for bad connections. Make sure all connections are tight and free of corrosion.
	Improper spark gap	Adjust gap. Check spark on ground post.
Have spark, not lighting	Orifice plugged	Clean with tip cleaner.
	No gas at pilot	Check all appropriate valves and regulators to ensure they are open and set to correct pressure to send gas to pilot. Check for air or liquid in the line. If so, purge line with gas
	Improper gas pressure	Set pilot line pressure to 6-10 psi (Natural gas)
Poor flame quality	Flare tip is not seated properly or can't move freely	Shut well in and move tip. Clean out debris. May use steel wire brush to clean off flare tip and ball. If tip is still stuck, call factory.
	Liquid in line	Drain and clean lines
	Springs are not operating properly or there is contamination in the gas	Call factory or replace

RECOMMENDED INSPECTIONS

	Installation	Monthly	Annually	Initial/Date
Purge pilot supply line with 3/8" pilot line not connected	X			
Check flare tips for debris, damage, misalignment or sticking open • Lift ball up 1/8" should drop freely • Ball and flare tip should seat with no gap • High pressure flare tip should rotate freely	X	X		
Check pilot for spark and/or listen for an audible "snap"	X	X		
Check thermocouple line is properly secured with hose clamps to the 3/8" stainless tube; no plastic zip ties used except at control box	X			
Check that data logger, if used, is connected and running properly (Green light blinks every ten seconds)	X	X		
Check ignition line from fencer to connection on pilot. All connections must be tight. Cannot touch any metal surfaces.	X		X	
Thermocouple probe is inserted completely into the thermo well	X			
Top of pilot is 1 to 1.5 inches below the top of the high pressure or low pressure barrel	X			
No copper wire or plastic in the flare pit (except for ground rod)	X			
First stand max of 6' from the flare	X			
Max distance between stands is 8' and stands are in a straight line	X			
All connections are tight: flange bolts, compression fittings, pipe connections	X			
Check ground line from pilot tip to ground rod and from fencer to ground rod. All connections must be tight.	X		X	
No cracked insulators on igniter wire	X		X	
Thermocouple reading properly—look at thermoworks file and/or plug thermocouple into reader	X	X		

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FLARE SOLUTIONS
Specifications

Steffes is committed to working with our customers to provide the simplest, most efficient, and most reliable solutions for flaring requirements. Our flares are designed to help operators meet the EPA 40 CFR §60.18 requirements, including our patent pending variable orifice design.

Data is for reference only. Call Steffes Technical support for more specific information.

Flare Tip Model		Technology	Back Pressure*	Rated Flow*[1] Meeting 40 CFR 60.18	Max Flow Capacity	Power Required	Pipe Connections	Typical Installations	
								Produced Gas	Tank Gas
High Pressure	SHP-6	Variable Orifice	5.5 - 10 PSI	1.1 MMSCFD	2.2 MMSCFD*[2]	No	4"	X	
	SHC-6		4 - 6 PSI	3.0 MMSCFD	6.0 MMSCFD*[2]	No	4"	X	
Low Pressure	SVG-3B4		3 - 5 OSI	106 MSCFD	750 MSCFD*[3]	No	3"		X
	SVG-3D4		4 - 6 OSI	106 MSCFD	750 MSCFD*[3]	No	3"		X
	SVG-3D8		7 - 10 OSI	120 MSCFD	750 MSCFD*[3]	No	3"		X
	SAA-2	Air Assist	0 - 3 OSI	200 MSCFD	See chart 4	120 v	3"		X
	SAA-4		0 - 1 OSI	600 MSCFD	See chart 5	480 V 3 Phase	4"		X
Pilot*[4]	SPL-1	Pilot	8 PSI	264 SCFD	N/A	Spark System Required	3/8" Compression	X or Propane	

*Measured at flare tip. *[1] "Rated Flow" is the flow rate used by independent third parties to confirm Steffes' flare compliance with the perspective provisions of 40 CFR 60.18. Gas flow rates that do not exceed these values can be assumed to comply with all relevant EPA flare performance requirements. *[2] "Max Flow Capacity" is the highest flow rate allowed by Steffes for use in each specified flare. Flow rates above the "Max Flow Rate" may void warranties. *[3] All low pressure flares can meet requirements of 40 CFR 60.18 if smokeless operation is confirmed by Method 22. Also will need to be evaluated for flame stability re-light capability, and radiation. *[4] Pilot can run at 6 - 10 PSI, Flow Rate will vary by pressure and gas composition.

VARIABLE ORIFICE FLARES



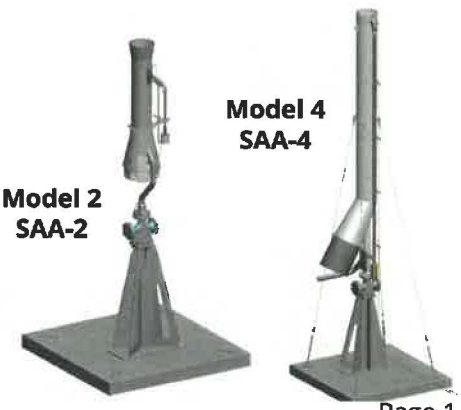


SHP-6 **SHC-6** **SVG-3B4** **SVG-3D4** **SVG-3D8**

The Steffes Variable Orifice Flares give optimum system performance over a wide range of gas flows for both high pressure and low pressure gases. Configure your flare system with singular or multiple flare tips to maximize performance. Models SHP - 6, SHC - 6, SVG - 3B4, SVG - 3D4, and SVG - 3D8.

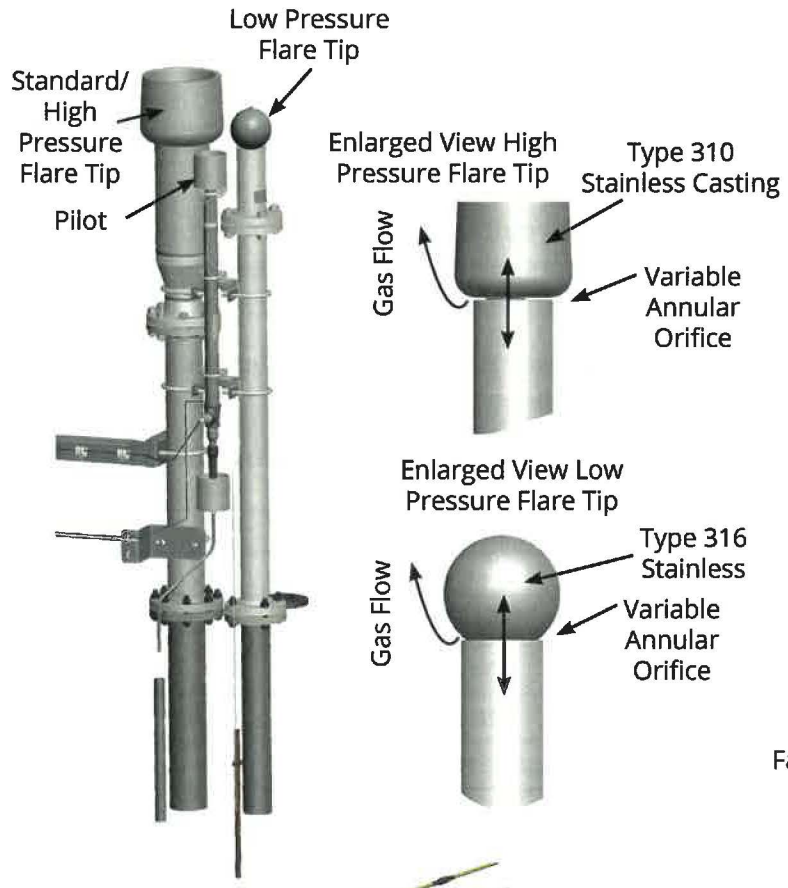
AIR ASSIST FLARES

The Steffes Air Assist Flares burn low pressure gas over a wide range of flow rates. Low pressure gas is mixed with air from a variable speed fan to provide a clean burn. Model 2 (SAA - 2) and Model 4 (SAA - 4).



VARIABLE ORIFICE FLARES

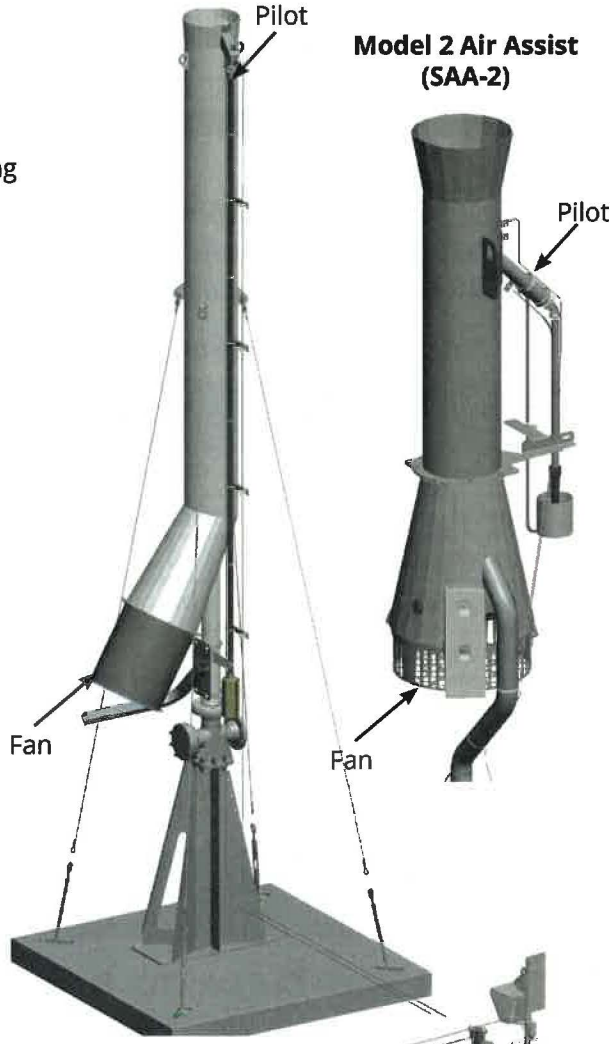
Modular Design: Three (3) Pieces can be used together or separately

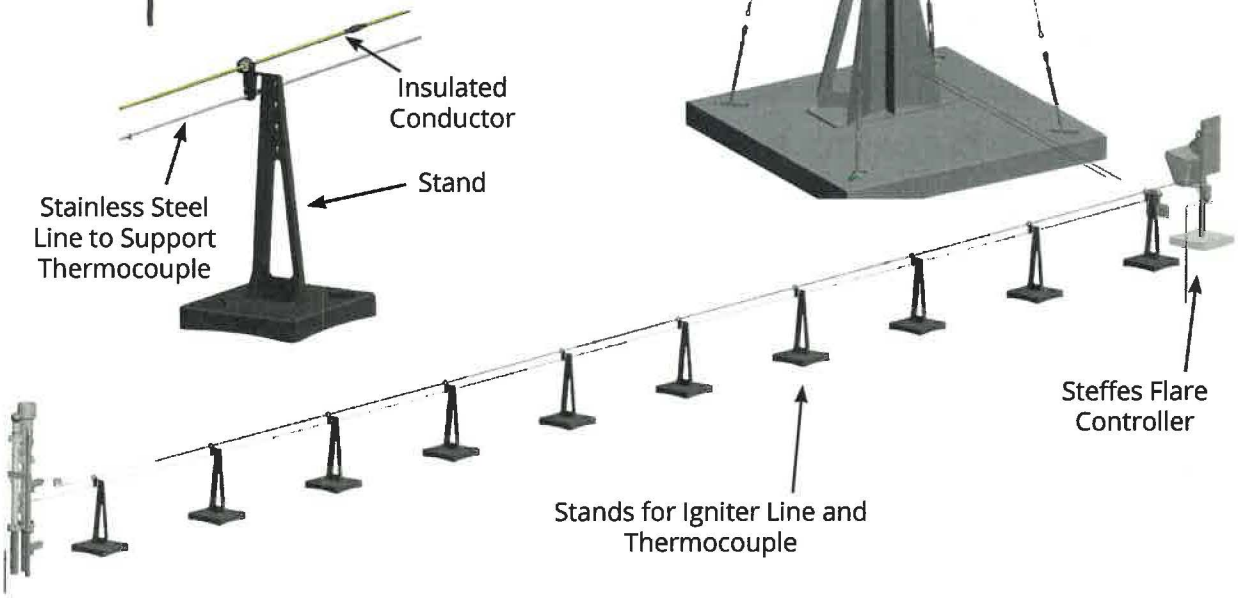


AIR ASSIST FLARES

Model 4 Air Assist (SAA-4)

Model 2 Air Assist (SAA-2)





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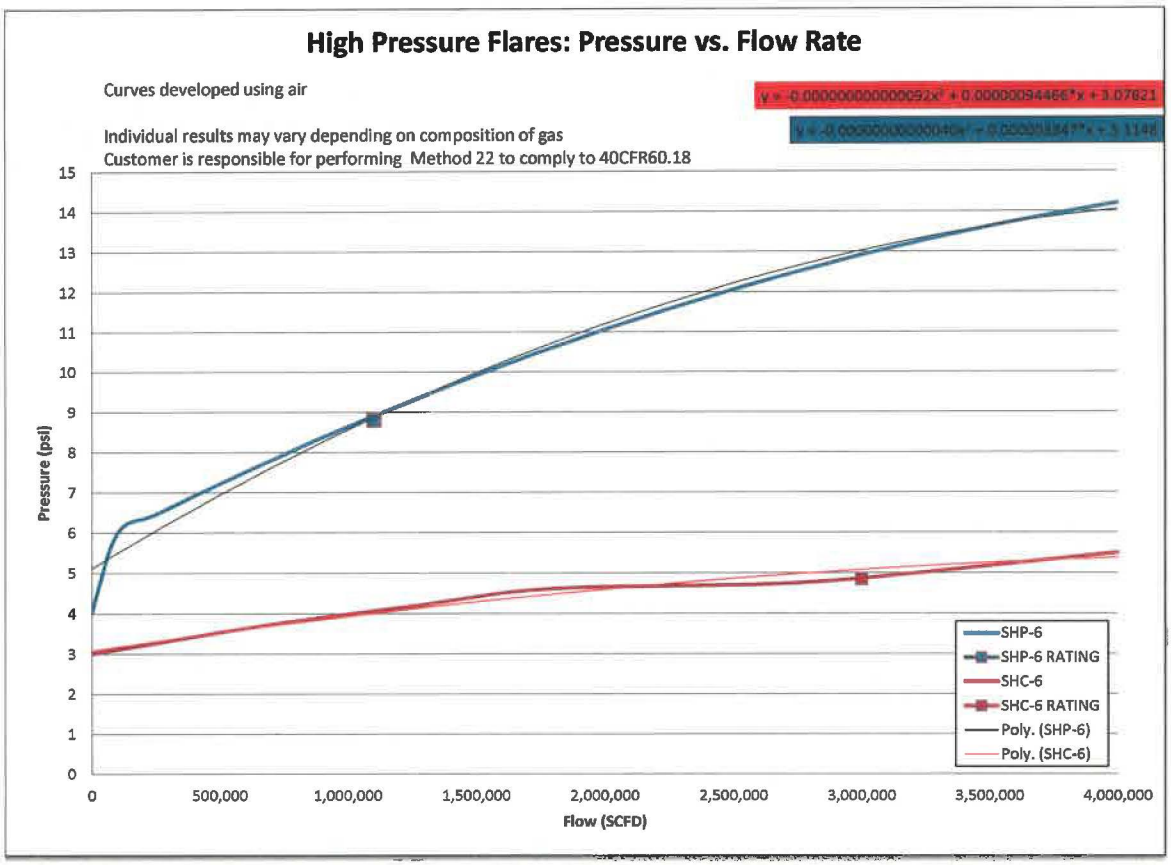
Phone: 888.783.3337
www.steffes.com
oilandgas@steffes.com

CHART 1



SHP-6

Maximum Rate Tested by 3rd Party	1.1 MMSCFD
Minimum Rate Tested	0.05 MMSCFD

SHC-6

Maximum Rate Tested by 3rd Party	3.0 MMSCFD
Minimum Rate Tested	0.05 MMSCFD

GAS CHARACTERISTICS (SEPARATOR GAS) DURING 3RD PARTY TESTING

Specific Gravity at 40 psig and 100F	0.89*
Gross Heating Value	1550* BTU/SCF

*Pressure was measured at the test port on tip during third party testing.

*Data is from third party test report. Flare is designed to operate with 1100 to 2500 BTU/SCF gas. Performance can be affected by specific gas composition.

*Flares are able to handle more flow than the current ratings allow, however "Max Flow Capacity" is the highest flow rate allowed by Steffes for use in each specified flare. Flow rates above the "Max Flow Rate" may void warranties.

*Data is for reference only.

*Smokeless operation is achieved by building pressure in the flare, and the Minimum Rate is defined as typical flow required to begin building pressure in flare barrel. Minimum Rate can be affected by conditions restricting the proper seating of the translating tip and the barrel resulting in lower operating pressures. Flares operating at pressures less than those shown on chart can still meet the requirements of 40 CFR 60.18 if verification of smokeless operation is confirmed by Method 22.

CHART 2

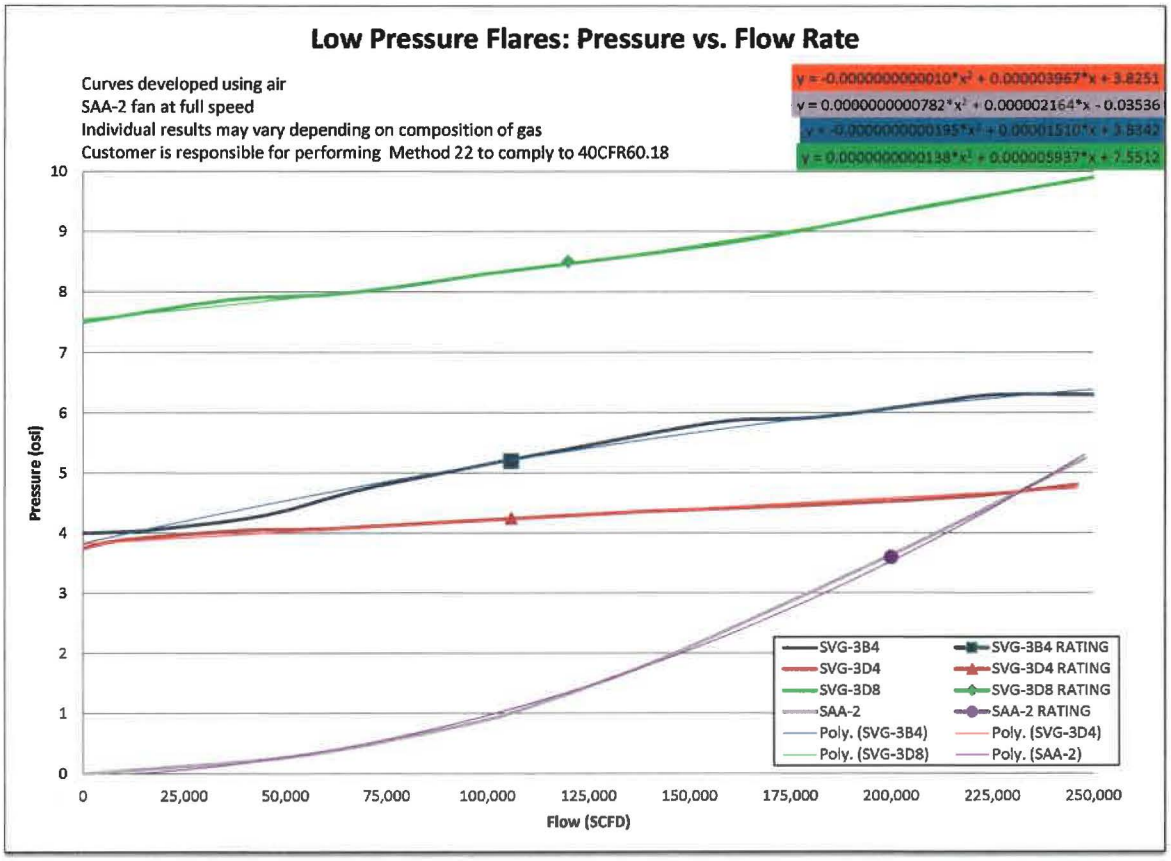


CHART 3

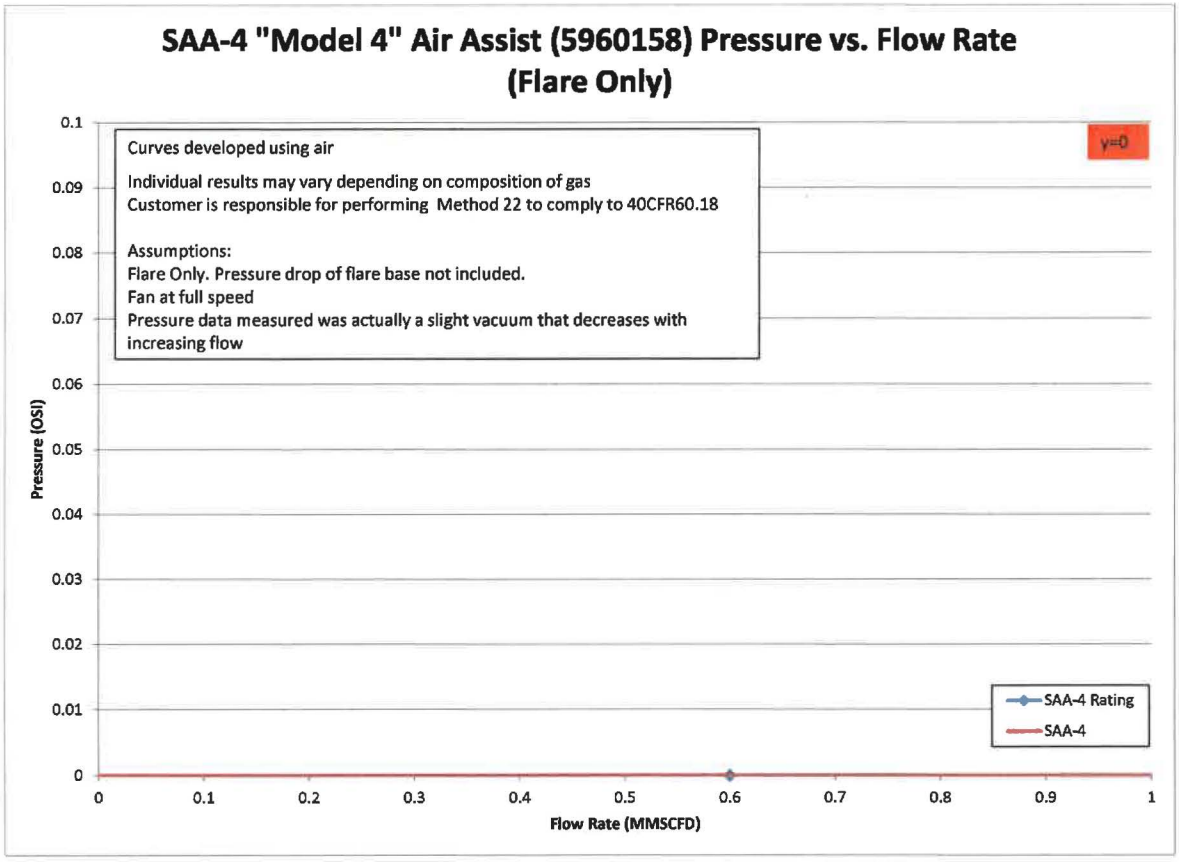


CHART 4

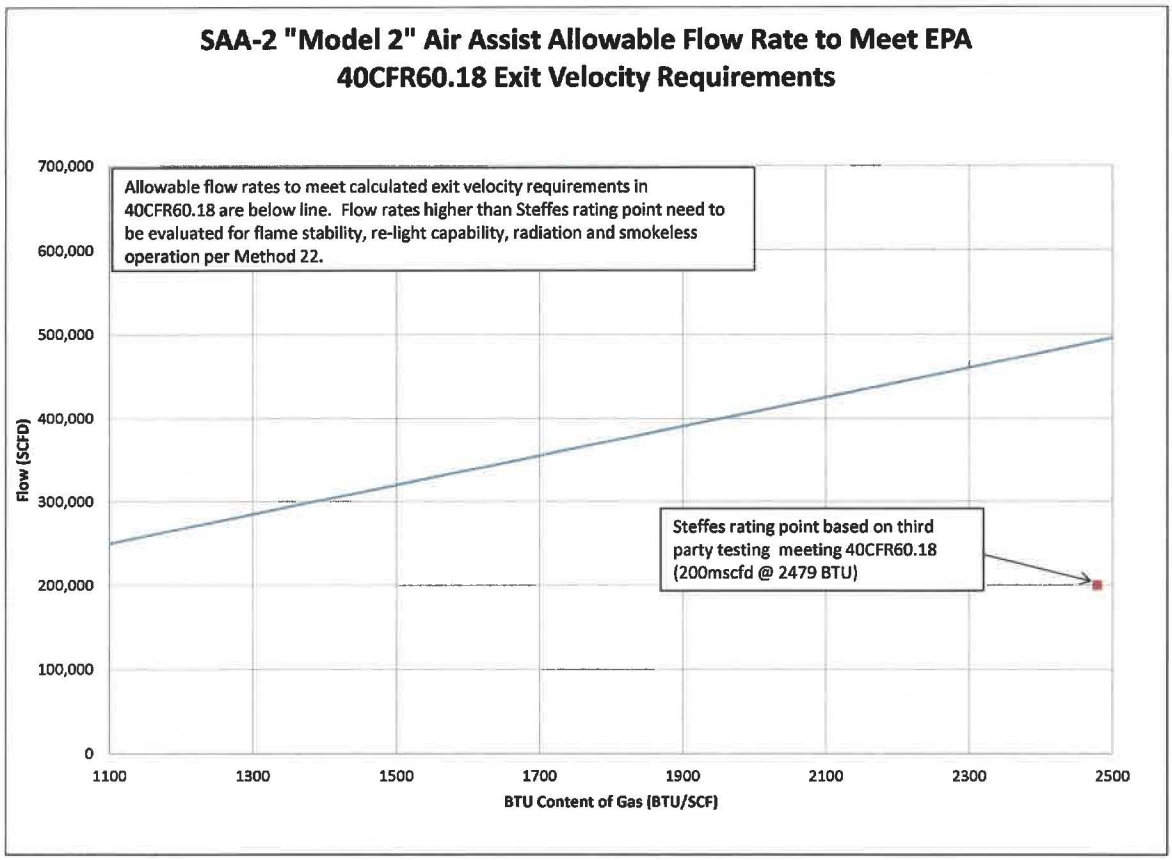
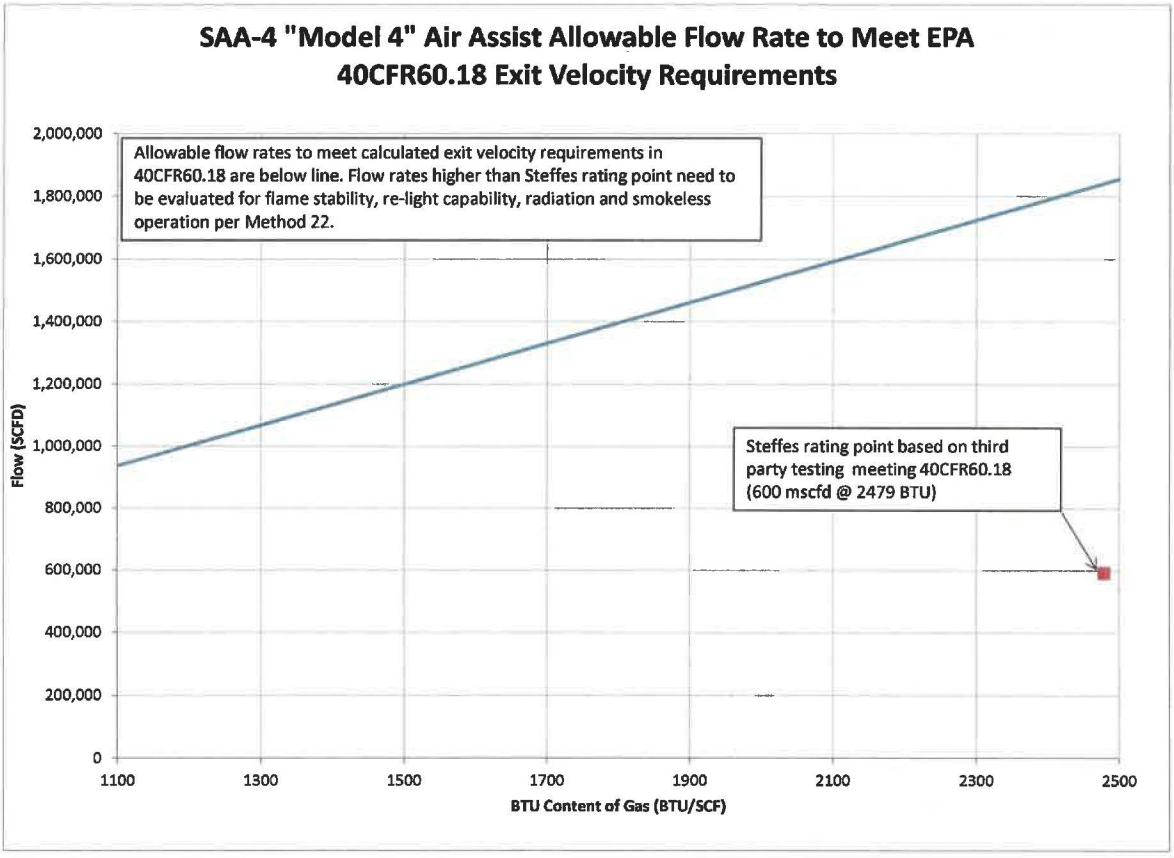


CHART 5



LOW PRESSURE FLARES	Rated Flow	Minimum Flow Rate	Gross Heating Value During Testing
Maximum Rate Tested by 3rd Party - SVG-3B4	106 MSCFD	18,000 SCFD	1750 BTU/SCF (on-site gas)
Maximum Rate Tested by 3rd Party - SVG-3D4	106 MSCFD	18,000 SCFD	2479 BTU/SCF (propane)
Maximum Rate Tested by 3rd Party - SVG-3D8	120 MSCFD	18,000 SCFD	2479 BTU/SCF (propane)
Maximum Rate Tested by 3rd Party - SAA-2	200 MSCFD	0	2479 BTU/SCF (propane)
Maximum Rate Tested by 3rd Party - SAA-4	600 MSCFD	0	2479 BTU/SCF (propane)

*Low Pressure curves represent testing data done with air as a medium, and pressure was measured at the test port on tip.

*Low Pressure Flares (SVG-3B4, SVG-3D4, and SVG-3D8) meet requirements of 40 CFR 60.18 up to flow rates of 750 mscfd if verification of smokeless operation is confirmed by method 22.

*Flares are designed to operate with 1100 to 2500 BTU/SCF gas. Performance can be affected by specific gas composition.

*Low Pressure curves represent the nominal to max pressure.

*Data is for reference only.

*Smokeless operation is achieved by building pressure in the flare, and the Minimum Rate is defined as typical flow required to begin building pressure in flare barrel. Minimum Rate can be effected by conditions restricting the proper seating of the translating tip and the barrel resulting in lower operating pressures. Flares operating at pressures less than those shown on chart can still meet the requirements of 40 CFR 60.18 if verification of smokeless operation is confirmed by Method 22.

Third Party has also confirmed the presence of a standing pilot flame monitored by a thermocouple on all Steffes flares in compliance with EPA 40 CFR 60.18.

CHART 6

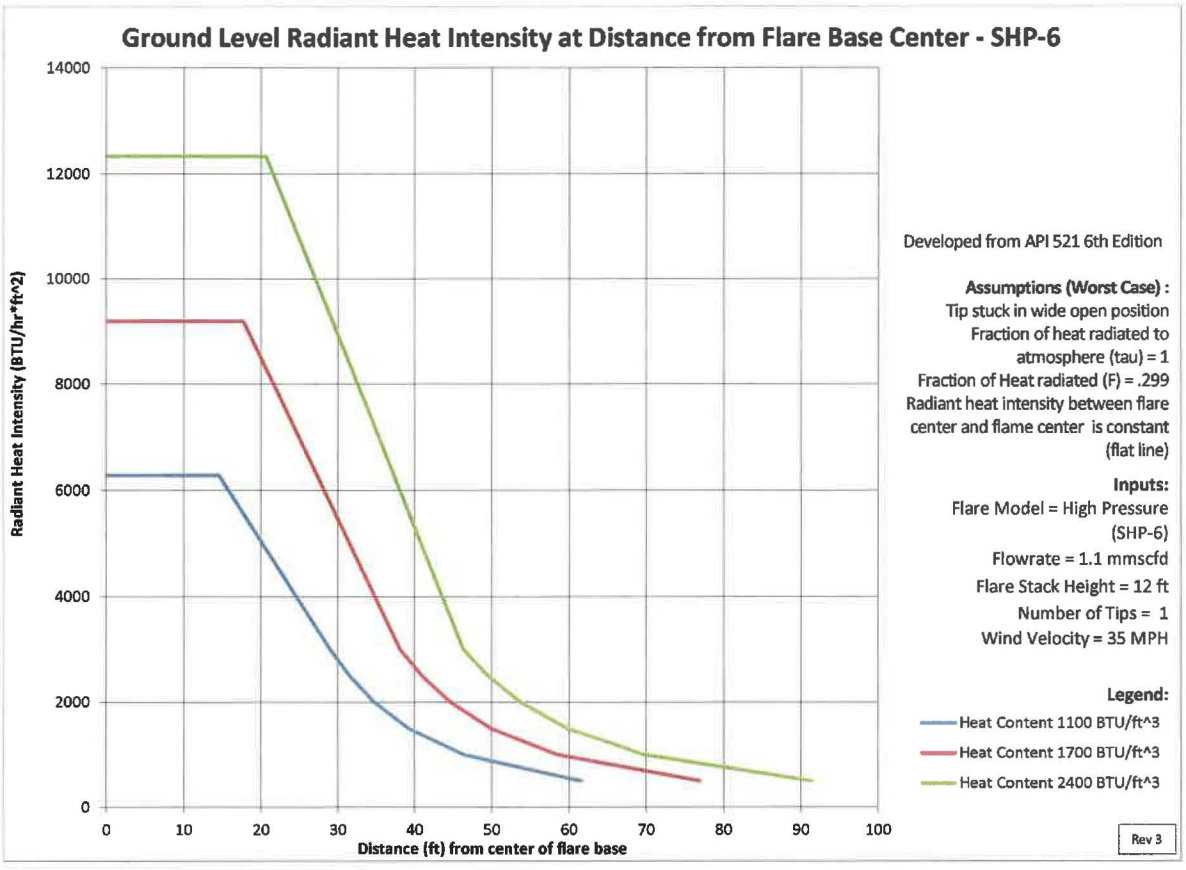


CHART 7

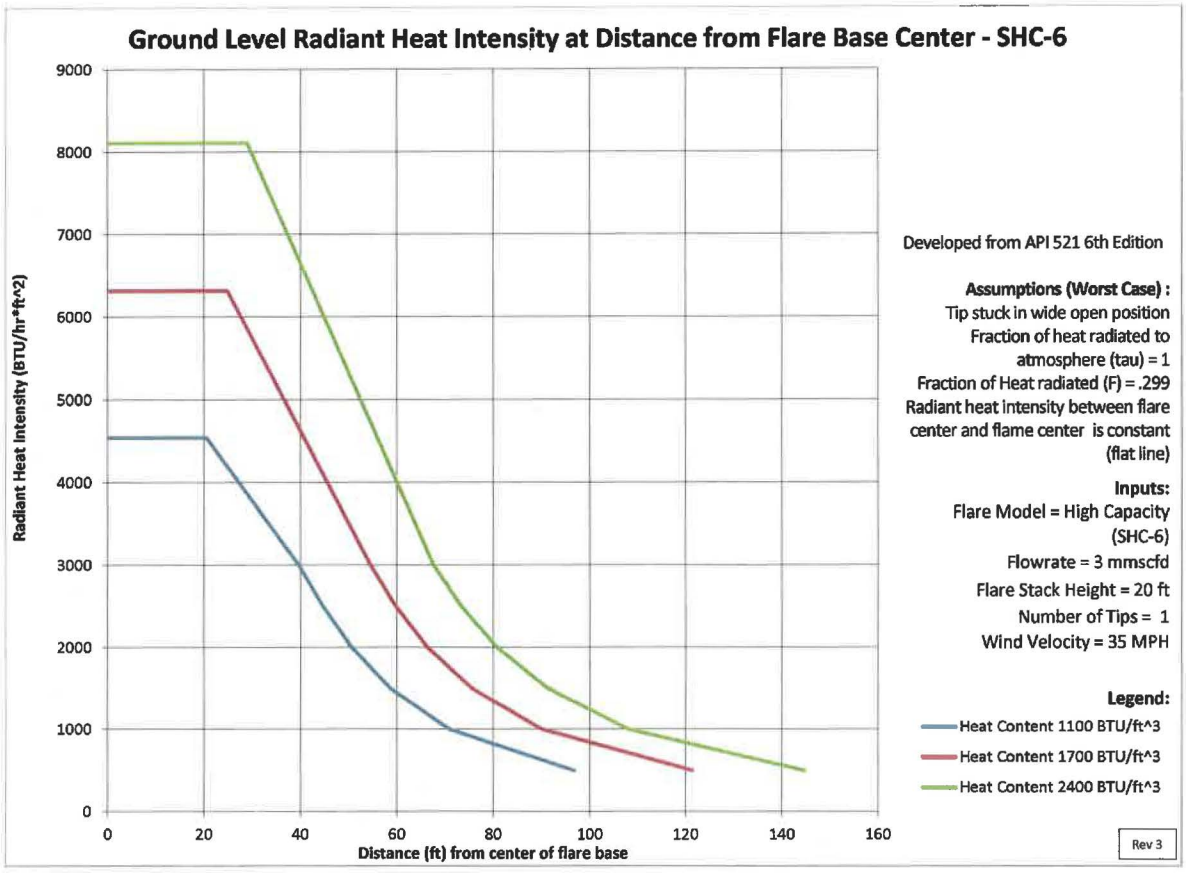


CHART 8

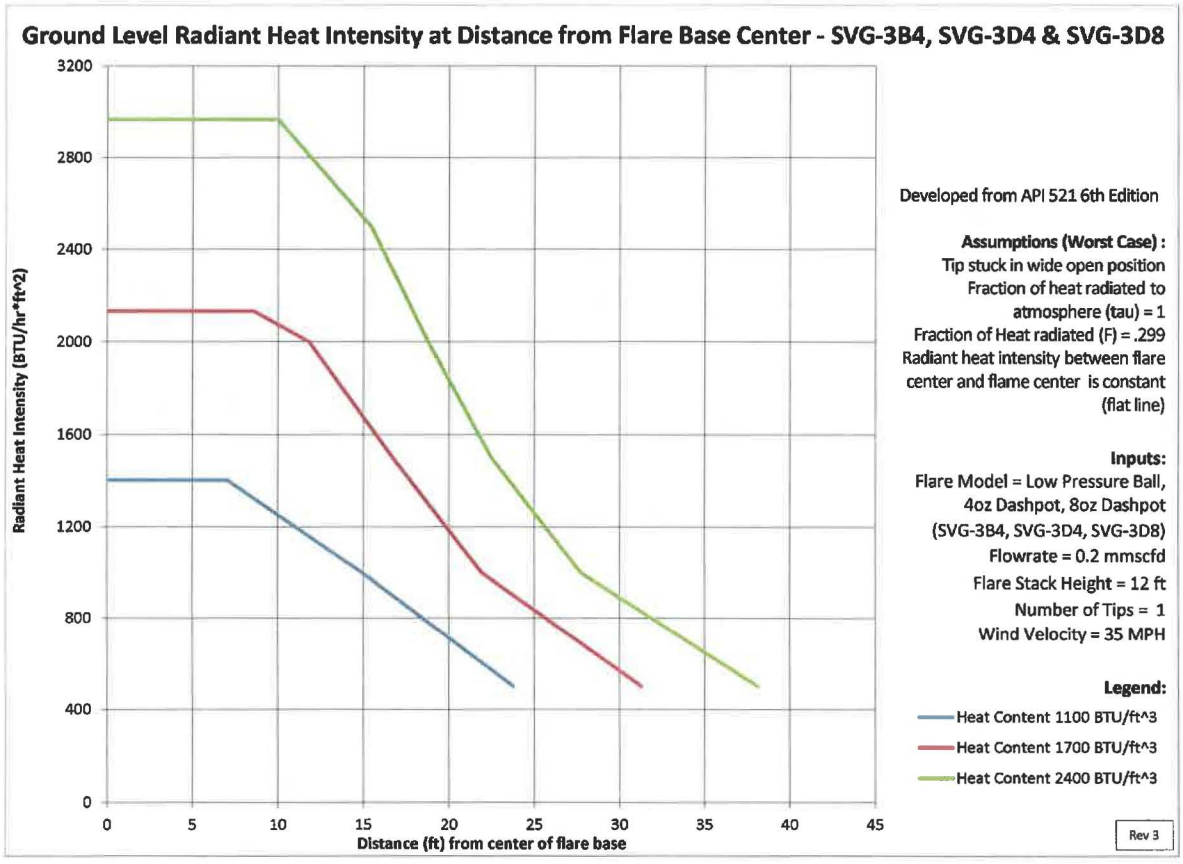


CHART 9

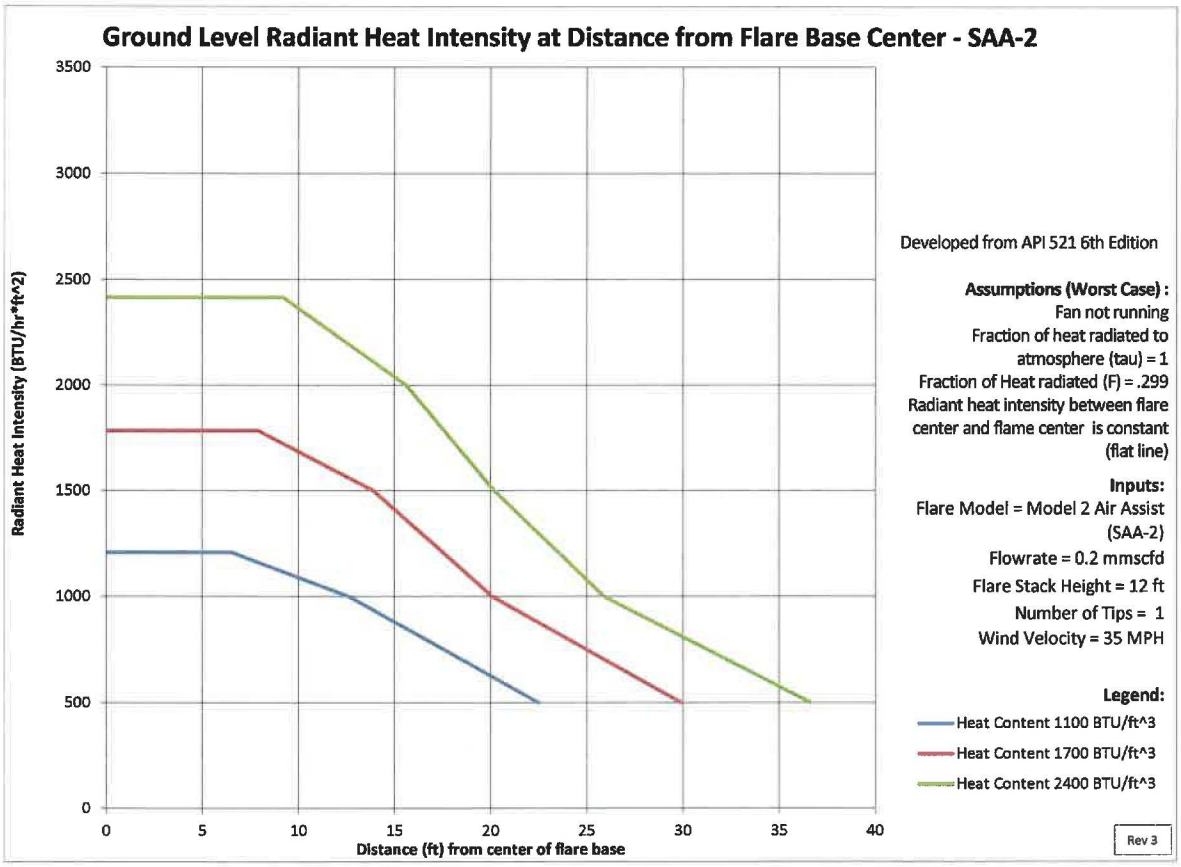


CHART 10

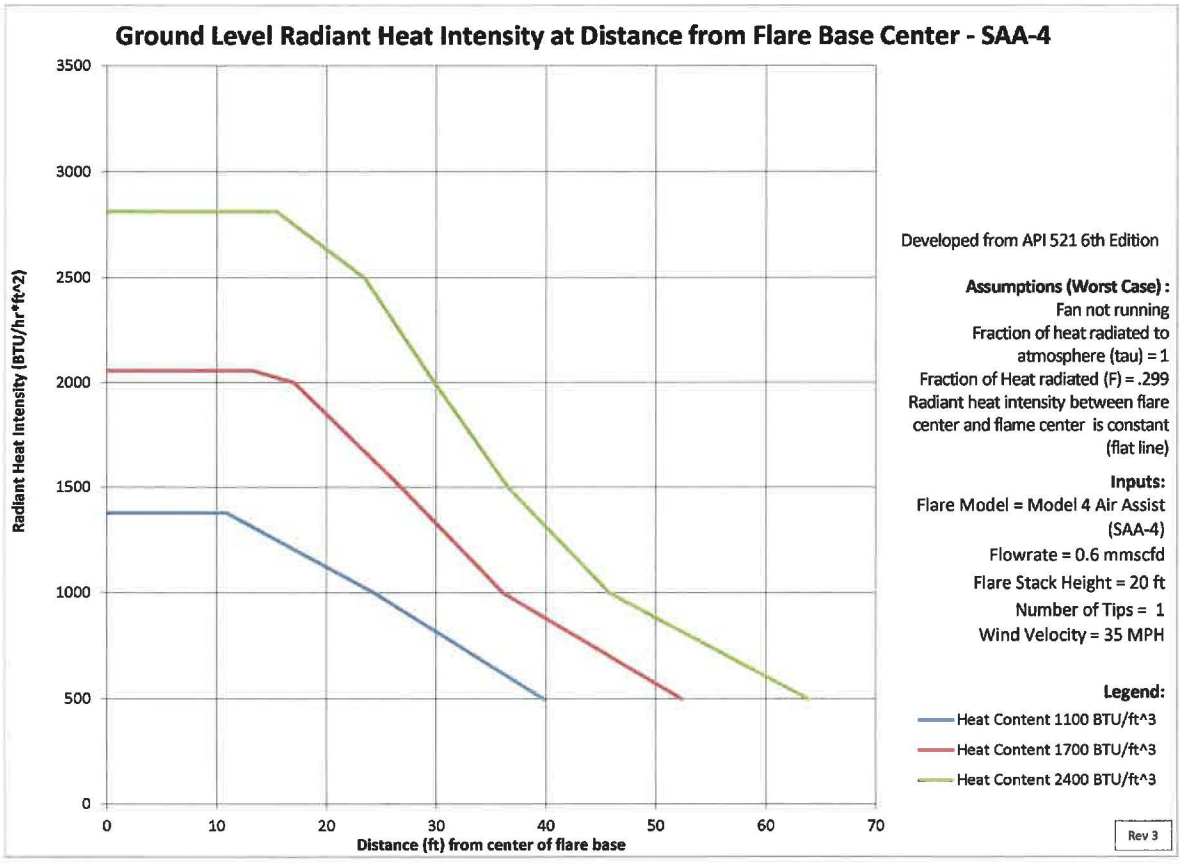
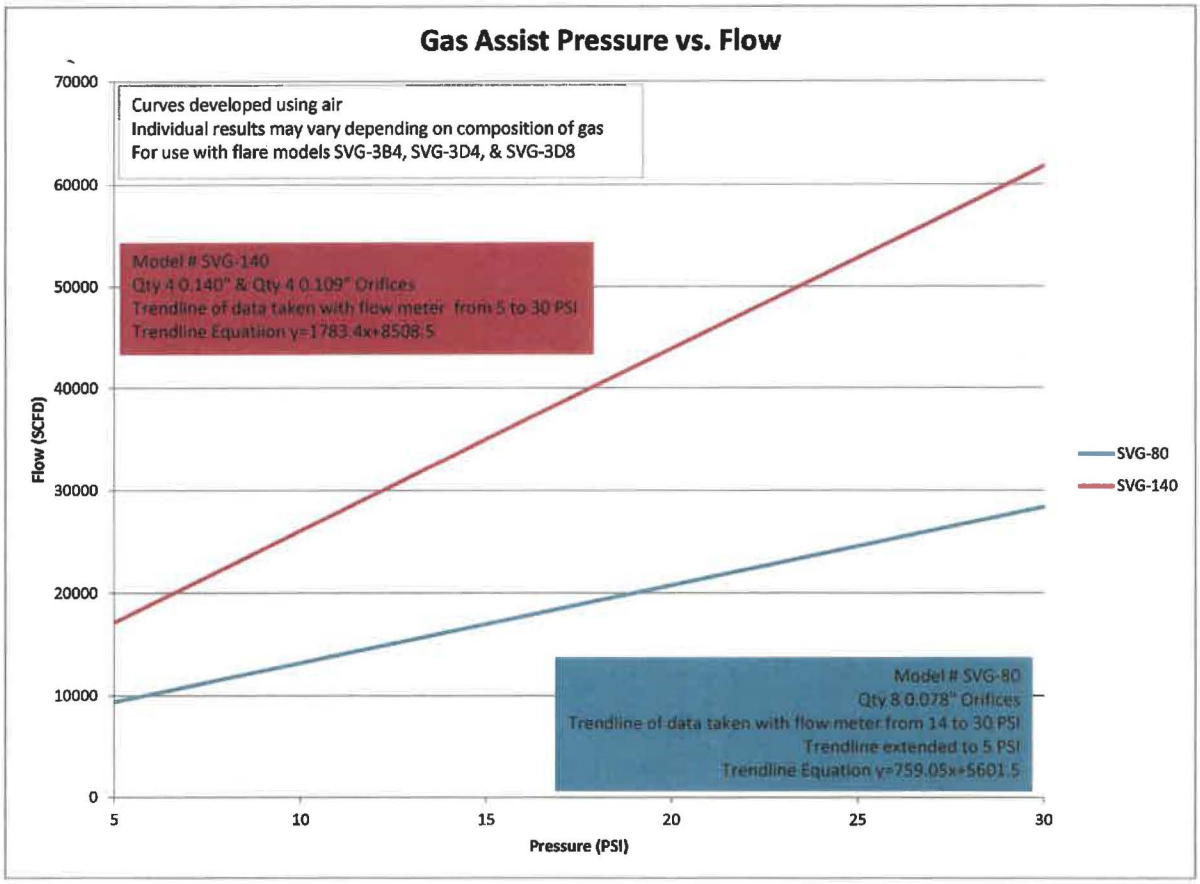


CHART 11



The Gas Assist is used to reduce smoke from low pressure flares, in cases when the BTU of gas is too high, the flow rate is too low or the flow rate is too high. Intended to fit low pressure models of the Variable Orifice Flares: SVG-3B4, SVG-3D4 and SVG-3D8.

Test data based on propane.

Data is reference only. Call factory for more specifics.

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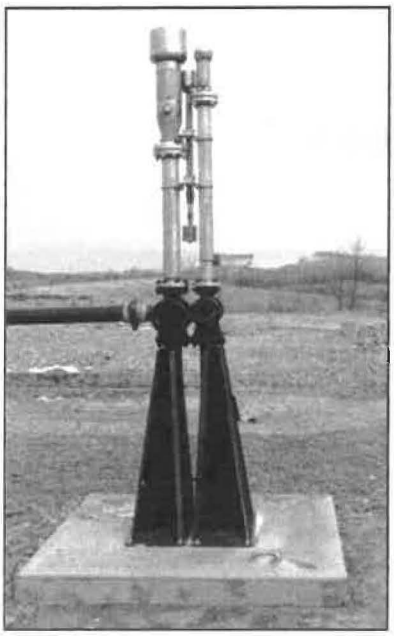
VARIABLE ORIFICE FLARES

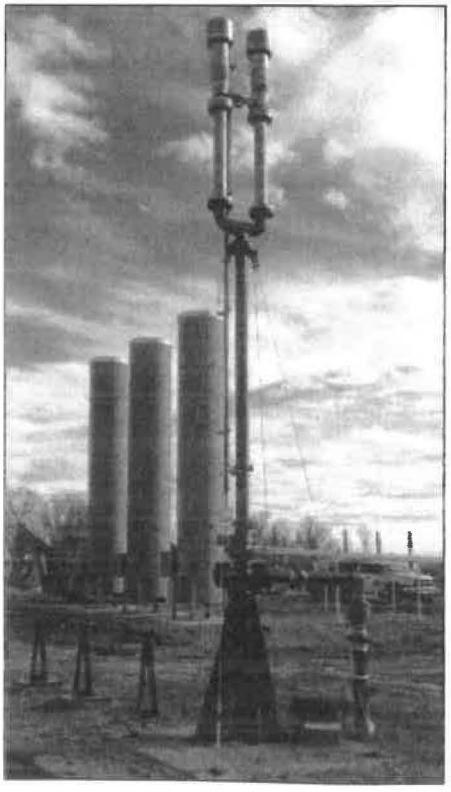


The Steffes Variable Orifice Flare offers optimum system performance with its ability to self-adjust to accommodate high, low or varying gas flow rates. Its patented variable annular orifice design efficiently mixes air with gas prior to combustion for smokeless, efficient operation and a clean consistent burn.

Our experienced team of professionals can help you configure assemblies to meet a wide range of pressures, including designs for multiple pressures. The continuous running stable pilot ensures the flare remains lit and running, even in some of the harshest conditions. With its smokeless operation and ability to accommodate multiple pressures, the Steffes Variable Orifice Flare has become the industry standard.

FEATURES:

- Various flow rates for high and low pressures
- Single, combo, and dual flare tip combinations
- Stainless steel construction
- Patent pending technology
- Field proven 98% destruction efficiency
- Designed to meet EPA 40 CFR §60.18 requirement



BENEFITS:

- High, low, and combination pressure systems
- Continuous running stable pilot
- Smokeless operation
- Thermocouple for monitoring pilot with data logger and temperature transmitter
- Reliable and complete solution

VARIABLE ORIFICE FLARES			
High Pressure	**High Capacity**	**Low Pressure**	**Pilot**
Model: SHP-6 **Weight:** 200 lbs	**Model:** SHC-6 **Weight:** 230 lbs	**Model:** SVG-3B4 **Weight:** 70 lbs	**Model:** SPL-1 **Weight:** 15 lbs
			
SHP-6	**SHC-6**	**SVG-3B4**	**SPL-1**

Examples of Flare Configurations:

Dual SHP-6 Flare
High Pressure Flare Base

SHP-6 Flare
High Pressure Flare Base

SHC-6 Combo Flare
Combo Flare Base

SHP-6 Combo Flare
ComboFlare Base

SHC-6 Combo Flare
Combo Flare Base

this one at Pyramid pad - North flare

Combo SHP-6 & Dual SVG-3B4 Flare
Combo Flare Base

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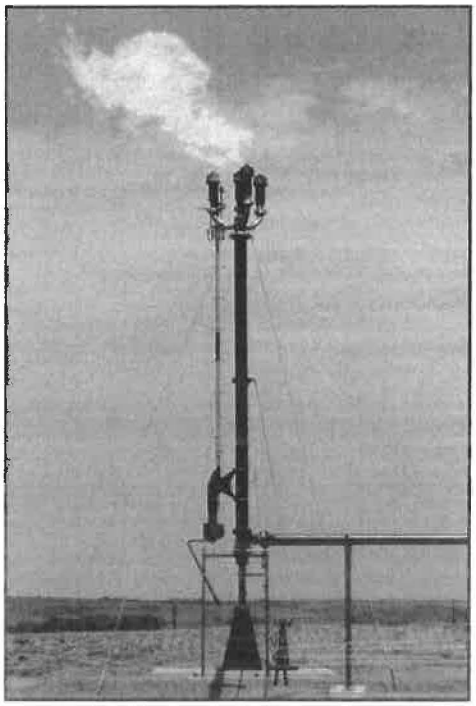
8" VARIABLE ORIFICE FLARES

The Steffes Variable Orifice Flare is available with 8 inch pipe connections and is available with 2, 3, or 4 High Capacity Flare tips. These flares are able to accommodate higher low rates while still providing the clean, smokeless burn.

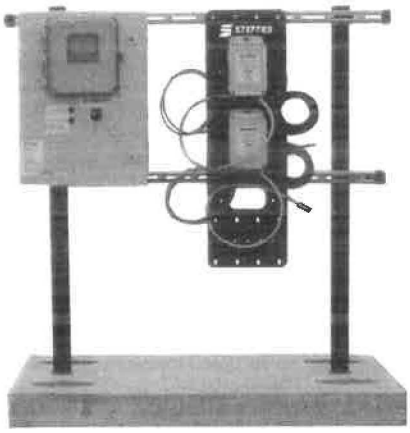


FEATURES:

- Stainless steel construction
- Patented variable orifice technology
- Field proven 98% destruction efficiency
- Designed to meet EPA 40 CFR §60.18 requirements
- Easy to service dual pilots on single retractable arm
- ETL listed Multi-Spark Flare Controller for control of both pilots
- Dual pilot. Retractable pilot arms available up to 40 feet for easy maintenance.

BENEFITS:

- Continuous running robust pilots meeting API 537
- Smokeless operation
- Thermocouples for monitoring pilots with dataloggers and temperature transmitters
- Reliable and complete solution



ETL LISTED US

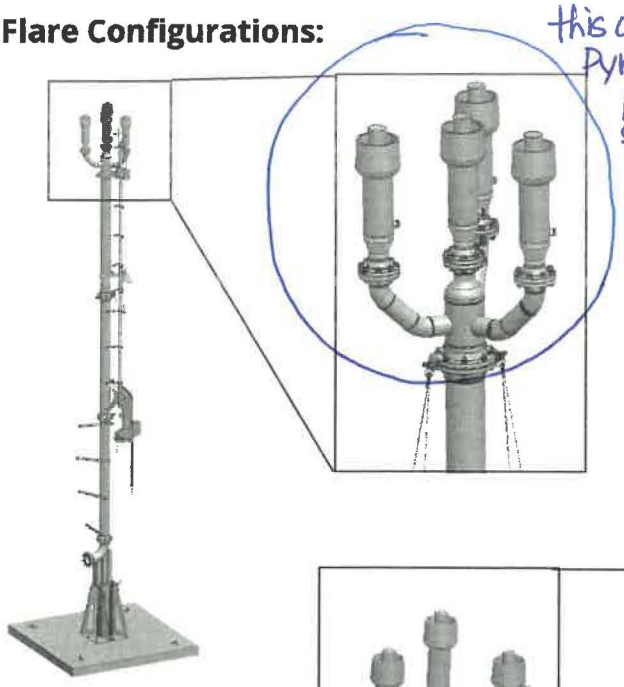
Intertek

VARIABLE ORIFICE FLARES

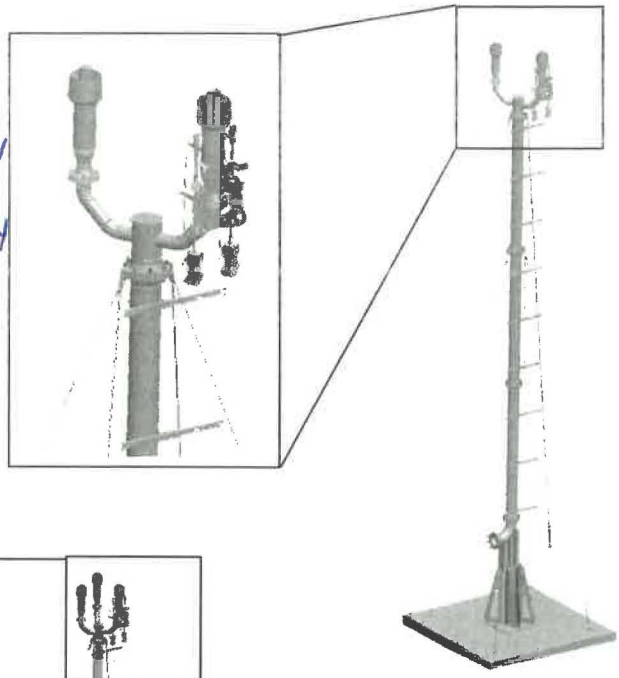
High Capacity Flare Tip	Pilot
Model: SHC-6 	**Model:** SPL 

Flare Configurations:

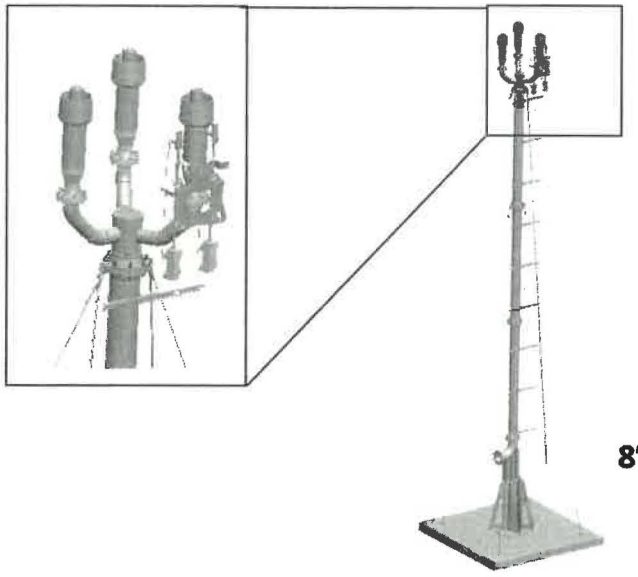
this one at Pyramid pad- south HP flare/ High capacity



8" Quad SHC-6



8" Dual SHC-6



8" Tri SHC-6

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AIR ASSIST FLARES

Steffes Air Assist Flares are a reliable solution to burn gases at low pressures. We've equipped our Air Assist Flares with an efficient variable speed fan to produce a smokeless, clean burn. The continuous running stable pilot ensures the flare remains lit and running, even in some of the harshest conditions. All Steffes Air Assist Flares have user-friendly controllers to operate the variable speed fans and provide reliable pilot monitoring.

In addition to their smokeless operation, Steffes Air Assist Flares can reduce back pressure for safer, more efficient production. Steffes Air Assist Flares come in two models to accommodate a variety of flow rates. Our experienced sales team can help you determine which model meets your requirements.

FEATURES:

- Two models with capabilities to burn gases at low pressure over a wide range of flow rates
- Clean burn from a variable speed fan
- Stainless steel construction
- Field proven 98% destruction efficiency
- Designed to meet EPA 40 CFR §60.18 requirement

BENEFITS:

- Low back pressure operation
- Continuous running stable pilot
- Thermocouple for monitoring pilot with datalogger and temperature transmitter
- Smokeless operation
- Reliable and complete solution

Examples of Flare Configurations: